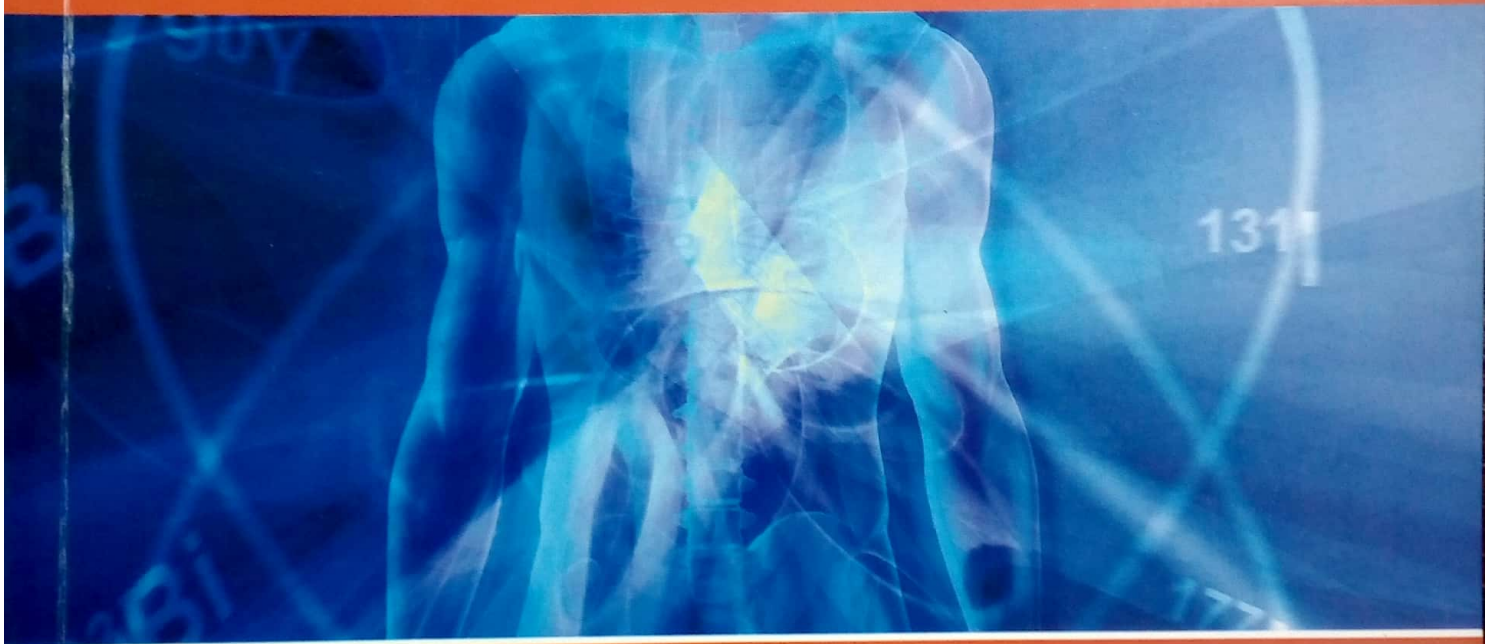
Volume-1, Issue-2 July - December, 2011

ISSN: 2220-7562

JBUMDC

The Journal of Bahria University Medical and Dental College



Bahria University Medical and Dental College,
13-National Stadium Road, Karachi, 75260, Pakistan

JBUMDC ISSN 2220-7562

The Journal of Bahria University Medical and Dental College, Karachi, Pakistan

Biannual Journal

Correspondence Address:
Editor, JBUMDC, Bahria University Medical & Dental College, 13-National Stadium Road, Karachi.
Email. editor.bumdc@bahria.edu.pk, Tel (021) 99240006-11 Ext- 319, Fax: 021-348503088. Website www.bumdc.bahria.edu.pk/jbumdc.
Published by: Bahria University Medical & Dental College, 13-National Stadium Road, Karachi, Pakistan.

CONTENTS

EDITORIAL

Social responsiveness of medical schools: time to address the social accountability of the medical institutions in Pakistan

Lubna Baig

The recent trend in medical education is to promote social accountability and social responsiveness of health professional's institutions to meet the health care needs of the country. The medical colleges are unique training institutes as they not only have to impart training to the medical graduates but also are service providers for the communities. They have a mandate from the society to provide quality service and at the same time impart high quality training to the future health care providers of the society. The medical schools in the developing world are now responding to the needs of the changing time and there is a growing awareness regarding the social accountability of the Colleges dealing with the medical and health sciences training.[1,2] This has become more important with the increasing globalization and the need for international accreditation of medical institutions. This editorial will address the need and responsiveness of medical institutions in Pakistan towards the society.

Social accountability; what is it?

Social responsibility, social responsiveness and social accountability are sometimes used synonymously however for an educated reader here are their subtle differences. The terms as defined by Charles Boelen[3,4] are:

- **Social Responsibility** is the awareness of the institution regarding duties towards the society.
- **Social Responsiveness** is the engagement in a course of actions responding to societal needs.
- **Social Accountability** adds a documented justification for the scope of undertaken actions and a verification that anticipated outcomes and results have been attained.

The terms as described by a recent comment by Gibbs[5] are catchy with more lip-service and less of action.

✉ **Lubna Baig**

Managing Director of the Alberta International Medical Graduate Program, Associate Professor in the Medical Education and Research Unit in the Department of Community Health Sciences, Faculty of Medicine at the University of Calgary, Canada.

Email: lbaig@hotmail.com

Received September 28, 2011, Accepted October 09, 2011

The focus has not been caught-own by the developing world and less by Pakistan. Boelen C in1995 proposed a grid to measure the social accountability of health care institutions[6].The grid evaluates education, research and service provided by the medical institutions relative to the four universal values which are: quality, equity, relevance and cost-effectiveness of health care.[7] I had done a survey in 2004 to assess the social accountability of medical institutions of Pakistan using the Grid developed by Charles Boelen. I found that there was a general lack of understanding towards social accountability and the need to be socially responsive to the society. There were however some positive findings as per my assessment in the survey which were that:

- the education was to some extent responding to the needs of students.
- the services were of moderately high quality and offered according to needs of the institution and to some extent responded to the needs of the society.
- research was generally of high quality and relevant to the needs of the country.

Types of accountability

Two kinds of accountabilities have been discussed and accepted at the international forums viz: The accountability to the medical graduates and the society in which these institutions are based.[1,6]

1. Accountability to the students: When a new student enters the university after a tedious selection process in our country either in a private or a public institution then that student becomes a consumer/customer for acquisition of medical and related knowledge. Ideally the student should then be treated like an elite customer and bestowed upon with all the privileges associated with high-class service, this will then bring about a change in the attitude of the student when she/he will graduate to serve the society. The academic staff has a moral obligation and it is their duty to develop the much publicized five star doctors for the country as described by Charles Boelen of WHO, the five stars are:[7]

- Care provider
- Decision-maker
- Communicator
- Community leader
- Manager

2. Accountability to the society: The medical Colleges are also accountable to the society, which means that the services provided should be available, accessible, ethical, humanitarian and affordable. The curriculum should include the priority health problems of the country and the focus of the health care providers should be on the problems of the patient and their prevention. A socially responsible school also provides evidence of impact of its performance and conduct to the society.

The response of the developing world

There is a global consensus that the medical institutions should increase their capacity to respond to the needs and challenges of health care for citizens and society in general, in line with the core values of quality, equity, relevance and effectiveness.[8]

The University of Saskatchewan, Canada, developed the CARE model (Clinical activity, Advocacy, Research, Education and training) as a guiding tool for social accountability. The model is still under review however it does provide an example of a cultural shift in the attitude of the students and faculty.[1]

At the University of British Columbia (UBC), Canada there is now greater emphasis paid on making the future physicians more socially responsible. The UBC is trying to address this concern through changes in the curricula, training in the communities and research in social responsibility.[2]

According to Gibbs (2011), "the trend now is towards standards of social accountability--ensuring that graduates' competencies are shaped by the health and social needs of the local, national and even international communities in which they will serve". [9] But, in today's 'global village', if medical schools address the needs of their immediate community, who should address the needs of the wider global community?

With medical schools striving to produce fit-for-purpose graduates who will hopefully address the health needs of their country, is it now time for the medical education fraternity to extend their roles of social accountability to level this unlevel playing field? We believe so: the time has come for the profession to embrace a global accountability model and those responsible for all aspects of healthcare professional development to recognise their place within the wider global community."

According to Charles Boelen the time has come to address and measure the social accountability of all medical institutions.[4] It will be indeed in the benefit of the society, country and the institutions to foster collaborative research and development to address social accountability of medical institutions. The research will be able to appropriately shape the curriculum and will be an area of great significance for the future of medical education.

In Pakistan we have not even started to address the social responsibility of medical institutions. I do not intend to negate the efforts of the institutions in improving their curricula to meet the needs of the students and institutions. Most medical institutions in the public and private sector are constantly working towards improving education, service and research. Intuitively major aspects of social accountability are being addressed without conscious effort. This in itself is commendable however it is time to make a conscious effort to address this in the vision, mission and policy documents of the institution. The curriculum of the future physicians of Pakistan will require pedagogical approaches that are innovative, collaborative, participatory, and responding to the needs of the country and the world. The leadership as well as each faculty member can contribute to making its school more socially accountable by reorienting education, research and service delivery programmes towards priority health needs and challenges of society and ensuring that their efforts have achieved intended outcomes and impact.

So what should we do next?

- Quality improvement in medical education and evaluation standards to address social accountability must be addressed at the national level by accreditation bodies like, Pakistan Medical Dental Council and Higher Education Commission.
- Medical policies governing health care teaching institutions should address the social accountability of the institutions.
- A conscious effort should be made to develop an awareness of the social responsibility amongst the
    - Faculty
    - Students
    - Other stake holders
- An attempt should be made to develop partnerships between community & institutions.
- Students should be actively involved in curriculum development and review.

References

1. Meili R, Ganem-Cuenca A, Leung JW, et al. The CARE Model of Social Accountability: Promoting Cultural Change. Acad Med 2011;86:1114-9.

2. Dharamsi S, Ho A, Spadafora SM, et al. The Physician as Health Advocate: Translating the

Quest for Social Responsibility Into Medical Education and Practice. Acad Med 2011;86 (9):1108-13.

3. Boelen C. Prospects for change in medical education in the twenty-first century. Acad Med 1995;70(7 Suppl):S21-8; discussion S29-31.

4. Boelen C, Woollard R. Social accountability: the extra leap to excellence for educational institutions. Med Teach 2011;33:614-9.

5. Gibbs T. Sexy words but impotent curricula: Can social accountability be the change agent of the future? Med Teach 2011;33:605-67.

6. Boelen C, Heck J. Defining and measuring the social accountability of medical schools. Geneva, World Health Organization, 1995 (unpublished document WHO/HRH/95.7, available on request from Division of Organization and Management of Health Systems, World Health Organization, 1211 Geneva 27, Switzerland).

7. Boelen C. Frontline doctors of tomorrow. World Health 1994;47:4-5.

8. Boelen C. [Global consensus on social accountability of medical schools]. Sante Publique 2011;23:247-50. [Article in French].

9. Gibbs T, McLean M. Creating equal opportunities: the social accountability of medical education. Med Teach 2011;33:620-5.

ORIGINAL ARTICLE

Role of TC-99m Thyroid scintigraphy in investigating Thyroid swelling: is it of any help for surgeons?

Iqbal Hussain Udaipurwala, Muhammad Shuja Farrukh, Zahid Mahmood Raahat

Abstract

Objective: To assess the role of thyroid scintigraphy with technetium 99m pertechnetate in patient undergoing thyroid surgery for thyroid swelling and whether this investigation helps in decision making for surgeons regarding management strategy.

Study Design: A prospective quasi-experimental study.

Place & Duration of Study: This is a multicentric study conducted at the department of ENT, Head & Neck Surgery, Civil Hospital Karachi, Jinnah Medical College Hospital, Hamdard University Hospital, and PNS Shifa, over a period of three and half years from August 2006 to February 2010.

Patients & Methods: A total number of 110 patients were included in this study undergoing thyroid surgery for any thyroid swelling where thyroid scintigraphy with Tc-99m pertechnetate was done in all the cases with FNAC, thyroid sonography, thyroid function tests and post-operative histopathology. Data collected was analyzed for sensitivity, specificity, accuracy, positive predictive value and negative predictive value of thyroid scintigraphy for malignancy.

Results: In this study, on thyroid scintigraphy 50.9% of the cases were multinodular goiter, 48.2% were cold nodules and 0.9% was hot nodule. On post-operative histopathology 94 cases (85.4%) were benign swellings and 16 cases (14.6%) were malignant. Sensitivity, specificity, accuracy, positive predictive value and negative predictive value of thyroid scintigraphy were found to be 68.7%, 55.3%, 57.2%, 20.7% and 91.2% respectively.

Conclusion: In our view thyroid scintigraphy should not be ordered in every case of thyroid swelling because of its low predictive value for malignancy.

Key words: Thyroid scan, Tc-99m, Thyroid surgery, Hot & cold nodules

Introduction

Thyroid scintigraphy is often ordered as a routine baseline investigation in patients who present with any type of thyroid swelling. Earlier radioactive iodine I^{123} and I^{131} and later technetium 99m pertechnetate was in use for thyroid scintigraphy. Two to three decades before this was the only investigation available for assessing size, functionality and nodularity of the thyroid gland. A nodule may appear as cold, warm or hot depending upon the tracer uptake in comparison to its surrounding tissues. A hot nodule is almost always benign and does not require further diagnostic evaluation. Majority of the cold nodules are also benign with only 5-8% risk of being malignant[1]. Considering that nodules are cold in approximately 70% of the cases, this parameter has an extremely low predictive value for malignancy[2]. In addition about 70% to 90% of thyroid disorders encountered in surgical practice are benign[3].

Considering the above facts, ordering thyroid scintigraphy in every patient undergoing thyroid surgery is a shear waste of resources and time. So this study was conducted to assess the role of thyroid scintigraphy and whether it helps on decision making regarding management or type of surgery.

Subjects and Methods

This is a multicentric study conducted at the department of ENT, Head & Neck Surgery, Civil Hospital Karachi, Jinnah Medical College Hospital, Hamdard University Hospital and PNS Shifa, Karachi, over a period of three and half years from August 2006 to February 2010. Inclusion criterion included all patients of thyroid gland swelling undergoing any type of thyroid surgery. Exclusion criteria included patients undergoing revision thyroid surgery for multinodular goiter (MNG), completion thyroidectomy for malignant disease and patients lost for follow up after thyroid surgery with no final histopathological report. A total of 123 thyroid surgeries were done during the above mentioned period, among them 3 patients have revision thyroidectomy for recurrent MNG, 5 patients have completion thyroidectomy for malignant disease and5 patients were lost for follow up with no final histopathological report available. Thus a total of 110 patients were included in this study.

Detailed history and clinical examination was done in all the cases along with relevant investigations like thyroid function tests, ultrasound thyroid gland and pre-operative fine needle aspiration cytology. Thyroid scintigraphy with Tc-99m pertechnetate was specifically done in all the cases. Surgery was planned after the report of these investigations and thyroid surgery ranging from isthmectomy to total thyroidectomy was done accordingly. Post-operatively all the specimens were sent for histopathology. All the data was recorded on a proforma and later saved and analyzed on SPSS version 11.

✉ **Iqbal Hussain Udaipurwala**

Professor & Head Department of ENT, Head & Neck Surgery, Bahria University Medical & Dental College, Karachi.
Email: udaipurwala@hotmail.com

Muhammad Shuja Farrukh
Assistant Professor of ENT, Head & Neck Surgery,
Dow University of Health Sciences and Civil Hospital Karachi

Zahid Mahmood Raahat
Assistant Professor of ENT, Head & Neck Surgery, BUMDC & PNS Shifa, Karachi

Received October 02, 2011, Revised Novmber 10, 2011 Accepted November 20, 2011

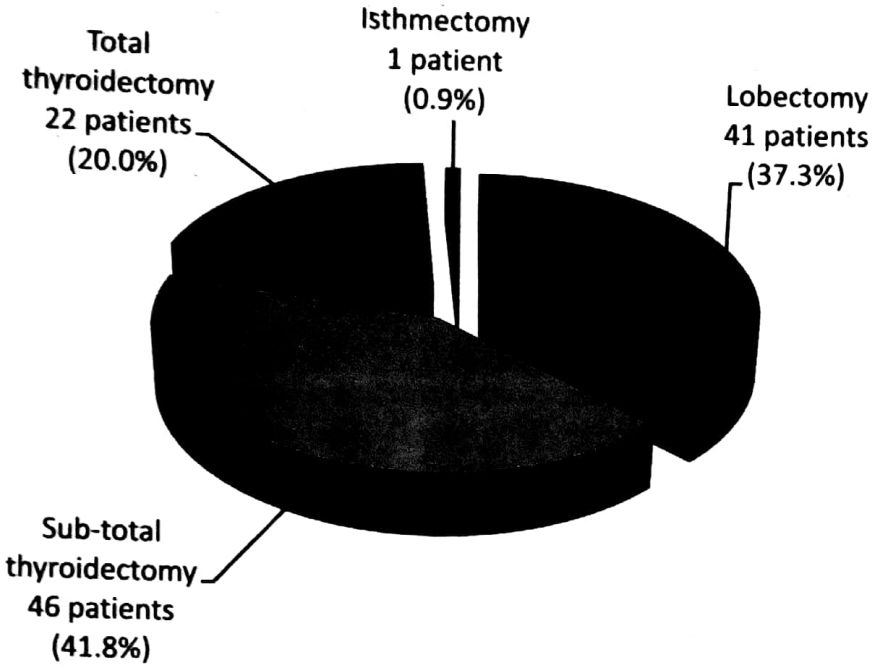


Figure -1 Types of surgeries performed

Results

A total number of 110 patients were included in this study. Among them 103 patients (93.6%) were female and 7 (6.3%) were male. Age ranges from minimum of 14 years to maximum of 61 years with mean age incidence of 32.8 years (± 1.28 years). Clinically out of these 110 patients, 38 (34.5%) have single nodule and 72 (65.4%) have multinodular goiter. On thyroid function tests, 93 patients (84.5%) were euthyroid, 10 patients (9.1%) were hypothyroid and 7 patients (6.3%) were hyperthyroid. Fine needle aspiration cytology (FNAC) was done in all the cases and showed benign lesion in 93 (84.5%) cases, malignant in 2 (1.8%) cases and inconclusive or doubtful malignancy in15 (13.6%) cases.

Figure 1 shows the extent of thyroid surgery done in these patients where sub-total thyroidectomy was done in majority of the cases (41.8%). On thyroid scintigraphy out of total 110 patients, 56 showed multinodular goiter (50.9%), cold nodule in 53 cases (48.2%) and hot nodule in 1 case (0.9%) (table 1).

Final histopathological report after surgery showed that 94 cases (85.4%) were benign whereas 16 cases (14.6%) were malignant (table 1). Among the malignant tumors, 10 cases were papillary carcinoma 4 cases were follicular carcinoma, 1 case of undifferentiated carcinoma and 1 case of lymphoma (fig. 2). Table 1 also shows correlation of thyroid scintigraphy with final histopathological findings, where out of 56 multinodular goiter 51 were benign and 5 were malignant, out of 53 cold nodule cases 42

Table - 1 Correlation of thyroid scan finding with final histopathological findings

Thyroid scan finding	Total cases	Final Histopathology	
		Benign	Malignant
Multinodular	56	51	5
Cold nodule	53	42	11
Hot nodule	1	1	0
Total	110	94	16

Table-2 True negative (TN), True positive (TP), False negative (FN) and False positive (FP) values for thyroid scintigraphy

		Histopathology	
		Benign	**Malignant**
Thyroid scan	Benign (multinodular + hot)	52 True negative (TN)	5 False negative (FN)
	Malignant (cold nodule)	42 False positive (FP)	11 True positive (TP)

were benign and 11 were malignant whereas 1 case of hot nodule was found to be benign. Table 2 shows that true positive cases in this study were 11 (cold nodule on scintigraphy and malignant on H/P), true negative cases were 52 (multinodular + hot nodule on scintigraphy and benign on H/P), false positive cases were 42 cases (cold nodule on scintigraphy and benign on H/P) and false negative cases were 5 cases(multinodular on scintigraphy and malignant on H/P). Sensitivity of thyroid scintigraphy in our study was found to be 68.7%, specificity was 55.3%, accuracy was 57.2%, positive predictive value was 20.7% and negative predictive value was 91.2% (table 3).

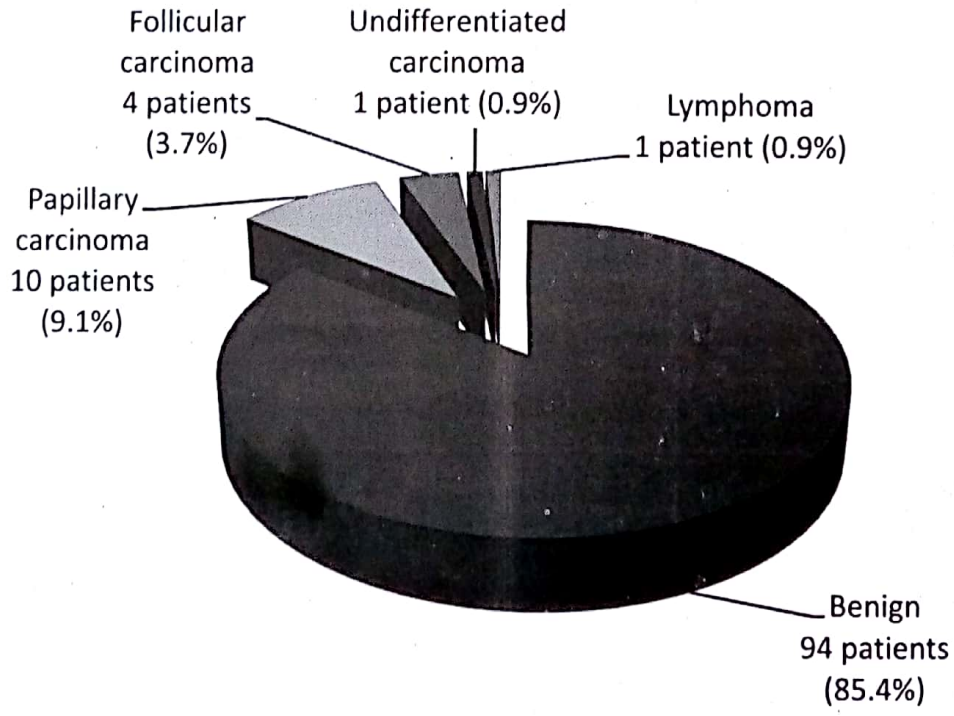


Figure - 2 Histopathology findings of specimen after surgery

Table- 3 Sensitivity, specificity, accuracy, positive predictive value and negative predictive value of thyroid scintigraphy

	Formula		Result
Sensitivity	TP/TP+FN	11/11+5	68.7%
Specificity	TN/TN+FP	52/52+42	55.3%
Accuracy	TP+TN/TP+TN+FP+FN	11+52/11+52+42+5	57.2%
Positive predictive value	TP/TP+FP	11/11+42	20.7%
Negative predictive value	TN/TN+FN	52/52+5	91.2%

Discussion

Radionuclide imaging has been the mainstay in the evaluation of thyroid nodule since 1939 when Hamilton and Soley demonstrated that malignant thyroid tissue concentrates less radioactive iodine than normal thyroid tissue[4]. Surveys by the American Thyroid Association and European Thyroid Association showed that 23% and 66% of practitioners respectively still routinely employ thyroid scan in the evaluation of a solitary nodule[5,6]. The most commonly used radioisotopes are technetium (Tc-99m) and I^{123}. As both these isotopes gives similar information, choice of radioisotopes is dependent of preference of the clinician and radiologist[7]. Tc-99m quickly washes out of the thyroid gland before being organified inside the gland, allows a shorter scanning time (20 – 30 minutes) and can be performed immediately after administration of radioisotope. I^{123} imaging needs to be performed 24 hours after administration and the scanning time can run 4 to 6 hours in length. Imaging resolution is also much better with Tc-99m than radioactive iodine. Nodules that are smaller than 1 cm cannot be detected reliably by either scan, as they are below the discriminating power of scintigraphic devices.

A useful investigations is one in which the results will alter the management or add confidence to clinical diagnosis[8]. Thyroid scintigraphy has lost its importance in the recent years as fine needle aspiration cytology and thyroid ultrasound are providing more reliable information. Thyroid scintigraphy is mostly done to assess size of the thyroid gland, nodularity within the thyroid gland or functionality of the thyroid nodules. About two to three decades ago thyroid scintigraphy was the only method for studying thyroid size, marker uptake (functionality) and presence of nodules. Now with thyroid ultrasound, assessment of thyroid gland size and nodularity can be made more accurately. In addition ultrasound has the advantage of being readily available, safe, non-invasive, relatively inexpensive and very efficacious for evaluation of the thyroid gland architecture[9]. Functionality or marker uptake was used to assess its malignant potential i.e. hot nodule is almost always benign and cold nodule could be malignant. Again fine needle aspiration cytology is considered to be more valuable in assessing malignant potential.

In our study all the parameters showed very low values i.e. sensitivity was 68.7%, specificity was 55.3%, accuracy was 57.2%, positive predictive value was 20.7% while the negative predictive value was high i.e. 91.2%. Thus it is concluded that thyroid scintigraphy is not a good investigation for predicting thyroid malignancy. In contrast most studies shows that FNAC plays a significant role in pre-operative diagnosis of thyroid swellings with high sensitivity, specificity and accuracy[10,11,12]. Similarly other studies conducted for thyroid scintigraphy also shows that it is not of much help for surgeons in every case[13,14]. A study conducted by Lumachi et al also shows similar results for thyroid scintigraphy, where sensitivity was 95.8%, specificity was 21.1%, accuracy was 35.7%, positive predictive value was 22.6% and negative predictive value was 95.5%[15]. In another study by Kountakis et al shows sensitivity as 91%, specificity as 19% and accuracy as 38%[16]. Extent of thyroid surgery performed in our series was also not dependent upon the findings of thyroid scintigraphy.

The role of thyroid scintigraphy is now limited to only few thyroid diseases like in ectopic thyroid gland, retrosternal goiter, nodule with low TSH value and metastasis cases. Despite new molecular genetics insights into congenital hypothyroidism, the thyroid scan remains the most accurate tests for the detection of ectopic thyroid tissue[17].

Conclusion

In our view thyroid scintigraphy should not be ordered in every case of thyroid swelling undergoing surgery. This should be used only in selective cases like for ectopic thyroid, retrosternal goiter and thyroid nodule with low TSH level.

References

1- Mansi L, Moncayo R, Cuccurullo V, et al. Nuclear medicine in diagnosis, staging and follow up of

thyroid cancer. QJ Nucl Med Mol Imaging 2004; 48: 82-95.

2- De-Martino E, Pirola E, Gandossi E, et al. Thyroid nodular disease: an emerging problem. Minerva Endocrino 2008; 33: 15-25.

3- Burguera B, Gharib H. Thyroid incidentalomas: Prevalence, diagnosis, significance and management. Endocrinol Metab Clin. North Am 2000; 29: 187-203.

4- Hamilton JG, Soley MH. Studies in iodine metabolism by use of a new radioactive isotope of iodine. Am J Physiol 1939; 127: 557-8.

5- Bennedbaek FN, Hegedus L. Management of the solitary thyroid nodule: result of a North American survey. J Clin Endocrinol. Metab 2000; 85:2493-8.

6- Bennedbaek FN, Perrild H, Hegedus L. Diagnosis and treatment of the solitary thyroid nodule: results of a European Survey. Clin Endocrinol 1999; 50: 357-63.

7- Kim N, Lavertu P. Evaluation of a thyroid nodule. Otolaryngol. Clin N Am 2003; 36: 17-33.

8- Khanzada TW, Memon W, Kumar B, et al. Thyroid scintigraphy: An overused investigation. G J Med Sci 2009; 7: 39 - 41.

9- Boone RT, Fan CY, Hanna EY. Well differentiated carcinoma of the thyroid. Otolaryngol. Clin N Am 2003; 36:73-90.

10- Hamburger JI. Diagnosis of thyroid nodules by fine needle biopsy: use and abuse. J Clin Endocrinol Metab 1994; 79: 335-9.

11- Matos LG, Kocjan G, Kurtz A. Contribution of fine needle aspiration cytology to diagnosis and management of thyroid disease. J Clin Patho 1992; 45: 391-5.

12- Morgan JL, Serpell JW, Cheng MSP. Fine needle aspiration cytology of thyroid nodule: how useful is it? ANZ Journal of Surgery, 2003; 73: 480-3.

13- Varcus F, Peix JL, Berger N, et al. Thyroid scintigraphy: its place in pre-operative diagnosis of thyroid nodules? Ann Chir 2002; 127: 685-9.

14- Varcus F, Bordos D, Peix JL, et al. When to prescribe scintigraphy in the exploration of thyroid nodules? Chirurgia (Bucur), 2003; 98: 219-24.

15- Lumachi F, Varotto L, Borsato S, et al. Usefulness of 99m Tc-pertechnetate scintigraphy and fine needle aspiration cytology in patients with solitary thyroid nodules and thyroid cancer. Anticancer Res 2004; 24: 2531-4.

16- Kountakis SE, Skoulas IG, Maillard AA. The radiologic workup in thyroid surgery: fine needle biopsy vs scintigraphy and ultrasound. Ear Nose Throat Journal, 2002; 81: 151-4.

17- Meller J, Becker W. The continuing importance of thyroid scintigraphy in the era of high resolution ultrasound. Eur J Nucl Med Mol Imaging 2002;29 (suppl 2):425-38.

Family planning awareness and practices among women attending tertiary care hospital at Faisalabad, Pakistan

Saba Tariq, Sundus Tariq

Abstract:
Objective: To investigate the family planning awareness and practices among women attending tertiary care hospital at Faisalabad, Pakistan.
Methods: A hospital based cross sectional study was conducted at Madina Teaching Hospital Faisalabad,Pakistan. Five hundred women of reproductive age (19-40 years) were included in this survey, to check their knowledge and practices regarding contraceptives use.
Results: The results of the study showed that 92% of the women had contraceptive knowledge but practicing women were 39.4% only. Almost 67% women were belonged to rural area and 33% to urban area. Regarding use of contraception, 39.4% were using one of the contraceptive method, 33% were intending to use and 28% did not want to use any method. The most common method used for contraception was condom (male partner) 36%, followed by contraceptive pills (23%) and female sterlization (19%). About 87% of the women had no constraints in using contraceptive method. Only 5.8% did not want to use because of religious constraints. The most common fear regarding use of contraceptive method was weight gain (13%).
Conclusion: There was wide gap in knowledge and practice of contraceptive use. The three common methods of contraception were condom, contraceptive pills, and female sterilization respectively. Because of low literacy rate females had some fear, myths or misconceptions which need to be clarified.
Key words: Family planning, contraceptives, condom

Introduction

Pakistan is the 6th most populous country of world[1]. According to the Population Reference Bureau 2005[2], the estimated population of Pakistan is 162.4 million and is expected to be 295 million in the year 2050. The fertility rate of 4.8 is showing failure to achieve our family planning strategies. Our annual growth rate is 1.9% which is much higher among other developing countries. In our country the proportion of females using contraceptives seem less as compared to other countries, which is evident by our high growth rate, and there are many barriers for the use of contraceptives.

The Government of Pakistan started an extensive family planning program in 1962 and the family planning promotion is the priority for the government of Pakistan in order to keep pace between socioeconomic growth and population expansion[3]. In every five year plan different governments have given importance to family planning and millions of rupees have been spent but couldn't achieve the targets to control population growth. A study suggested six major obstacles to contraceptive use: the strength of motivation to avoid pregnancy, awareness and knowledge of contraception, the social and cultural acceptability of contraception, perceptions of the husband's preferences and attitudes, health concerns, and perceived access to services[4]. There are also misconceptions about use of contraceptive methods.

We have to accelerate our efforts to improve family planning services and in this regard key to success is to expand information and service utilization and to work more on the reasons identified for underutilization of family planning services[5]. For improving the quality and better provision of family planning services there is need of more research from all over the Pakistan to find out the reasons behind the poor utilization of family planning services by common people and why the government efforts are not successful to control fertility rate.

There is immediate and serious need for analyzing the current trends in fertility behavior and identification of factors affecting fertility preferences in order to formulate strategies for increasing contraceptive prevalence and decreasing the birth rate[6]. This study was designed to investigate the family planning awareness and practices among women residing in Faisalabad district, so that future planning can be done to improve and promote the family planning services in this area specifically and in our country generally.

Subjects and methods

This hospital based cross sectional study carried out in the year 2007 at the Gynaecology Department of Madina Teaching Hospital affiliated with the Faculty of Health Sciences University of Faisalabad. A non-probability, convenience sample of 500 married women of reproductive age (19-40 yrs) was collected, attending the OPD either as patients or their attendants. Interviews were conducted, after obtaining an informed consent. A structured questionnaire was used to obtain information on sociodemographic features, parity, education, reproductive profile, contraceptive practices.

✉ **Saba Tariq**

Madina Teaching Hospial, 4-Km Sargodha Road, Faisalabad.
Email:supersaba1@yahoo.com

Sundus Tariq,
Madina Teaching Hospial, Faisalabad.

Received July 22, 2011, Revised October 10, 2010 Accepted November 12, 2011

contraceptive knowledge, and source of contraceptive knowledge, fears and constraints regarding its use. Reasons for non utilization of contraceptive services were also asked from the respondents. The data was entered and analyzed on SPSS version 13.

Results

The subjects included in this study belonged to different reproductive age groups ranging from 19-40 years. The age distribution, parity, education of women and age groups and education of husbands are given in the table 1.

Table-1Demographic features of married couples attending the OPD of the Madina Teaching Hospital

Variables	Frequency n =500
Age of married women in years	
19 – 24	59 (11.8 %)
25 – 29	202 (40.4 %)
30 – 34	124 (24.8%)
35 – 40	115 (23%)
Parity of the women	
Primipara	67 (13.4%)
P2 – P3	156 (31.2%)
P4 – P5	198 (39.6%)
>P5	79 (15.8%)
Education	
Illiterate	198 (39.6%)
Primary	123 (24.6%)
Secondary	119 (23.8%)
Higher	60 (12%)
Occupation	
Housewives	469 (93.8%)
Working women	31 (6.2%)
Husband Features	
Age (in years)	
19 – 24	57 (11.4%)
25 – 29	163 (32.6%)
30 – 34	131 (26.2%)
35 – 39	79 (15.8%)
> 40	70 (14%)
Education	
Illiterate	130 (26%)
Primary	161 (32.2%)
Secondary	123 (24.6%)
Higher	86 (17.2%)

The most of the women (39.6%) had 4 to 5 children and 31.2% had 2 to 3 children. The highest number of children to women was 13 and the lowest was 1.
The literacy rate among female was 60% and among male was 67%, the majority of people were having only primary and secondary education.
In this study 93.8% were the housewives. The women having knowledge about contraception were 92% and 8% of the women were having no knowledge regarding contraception. Table 2 is showing that 67% of study group belonged to rural area while 33% were from urban area.

Table-2 Showing distribution of knowledge and practice variables about family planning

Variables	Frequency n=500
Rural	287 (57.4%)
Urban	213(42.6%)
Ever used contraceptives	197 (39.4%)
Never used	303 (60.6%)
Contraceptive user practices	
Pills	49 (24.9%)
Condom	68 (34.5%)
Injectable	11 (5.6%)
Intrauterine devices	24 (12.2%)
Female sterilization	37 (18.8%)
Male sterilization	04 (2%)
Others	04 (2%)
Constraints regarding contraceptive use	
Family	6 (1.2%)
Social	14 (2.8%)
Religious	29 (5.8%)
Husband	17 (3.4%)
None	434 (86.8%)
Fear regarding contraceptive use	
Complications of operation	36 (7.2%)
Infections	23(4.6%)
Weight gain	66 (13.2%)
Bleeding	19 (3.8%)
Pain	23 (4.6%)
Perforation of Uterus	09 (1.8%)
Menstrual irregularity	29 (5.8%)
Cancer	13 (2.6%)
Failure of method	05 (1%)
Other problems	29 (5.8%)
No fear	248 (49.6%)

The women who had no intention to have more children and using contraceptive methods were 39% and 61% (305) never used any contraceptive.

The three commonly employed methods of contraception were use of condom by male partner (36%), oral contraceptive pills 23%, and female sterilization 19%. It was also interesting to know that few women had used more than one contraceptive method.

Only 13.2 % of women had some constraints regarding contraceptive use while the remaining 86.8 % had no constraints.

This study observed that females had some fear regarding contraceptive use. Three common fears were weight gain (13.2%), complications of operation (7.2%), and infections (4.6%).

Table 3 is showing that the difference between knowledge, attitude and practice., The 33.4% of the females intended to have four children while 7.2% intended to have 2, and 13.6% had 5 children while 22,12% showed no intentions. They were satisfied with whatever the number of children God has given them.

Table- 3 Showing difference between knowledge and practice

Actual number of children	Children intended to have							
	1	2	3	4	5	6	7	NI*
	No. of Women							
Women with 1 child	-	4	23	18	-	-	-	13
2	-	14	21	21	14	-	-	19
3	-	-	29	26	-	-	-	11
4	-	12	-	76	11	-	-	9
5	-	6	-	17	33	19	-	13
6	-	-	-	-	-	25	-	11
7	-	-	-	9	-	-	6	6
8	-	-	-	-	10	-	-	9
9	-	-	-	-	-	-	-	10
13	-	-	-	-	-	-	-	5

* NI : Women with no intention. They were satisfied with whatever the number of children God have given them.

Out of these 303 subjects the 54% females intended to use contraceptive and 46% did not want to use any contraceptive method.

The women who intended to use the contraception had more inclination towards female sterilization (16%) followed by oral contraceptive pills 12% (not shown in the table). They considered female sterilization safer and felt that it had least side effects with exception of few that had fear of surgery.

Discussion

Contraceptive use is not very common in our country. Pakistan is among the most populous countries of the world with a low economic growth (GDP 2.39%). Present study found that contraceptive prevalence rate (CPR) is 39.4% which is higher than the results mentioned by Population Association of Pakistan[7] (2002) in their statistical profile ie 28%. If we compare it with CPR of neighbouring countries as 48 % in India, 58% in Bangladesh and 70 % in Srilanka[2], its not very encouraging. Few other studies in Pakistan found that the contraceptive use is 29 % in district Tando-Allahyar, and Jamshoro[8], 28% in district Khairpur[9] and 28% in Lahore[10].

In this survey, it was also noticed that female were shy to talk about their sexual life, due to this reason they do not seek any help or guidance for any contraceptive method. Therefore, it is the need to provide proper knowledge to women in a very friendly atmosphere via counseling for using a method of contraception. There were women who were not using contraceptive methods because of myths they heard and fear that they developed regarding contraceptive methods.

In this study many women (34.8%) had 4 to 5 children and 25% had 2 to 3 children. It is interesting that most of the women intended to have 4 or 5 children no matter how difficult it is for them to bring up those children. The most of the women didn't plan and even not have intention to plan how many children they want. The highest number of children to women has 13 and the lowest was one. Some of the women intended to have 2 or 3 children but due to lack of knowledge about contraceptive use, constraints, and myths they have high fertility rate.

Our study showed that the predominate method of contraceptive was use of condom. A study conducted in district khairpur showed that the oral pills was the predominate method[9]. Another study at Sukker (Sindh) found that the predominate method of contraceptive was use of injections[6]. Saleem and Bobak[11] (2005) in the secondary analysis of national reproductive health and family planning survey 2000 found that women's education was the key factor in raising family planning practices.

Present study found that the three common contraceptive methods were condoms, pills and female sterilization. Haider[12] et al., (2009) also found the similar results in their study in Hyderabad district. It is also consistent with the findings of Pakistan fertility and family planning survey 1996-1997[13]. Pakistani women often rely on female sterilization after completion of desired family size[14] as observed in present study. It shows that in different parts of our country different methods of contraception are predominates according to the availability, feasibility, education of the couple and approval of the husband

etc. The results of a study in USA suggested that men's and women's method preferences are both significantly related to the couples' method choice[15].

Rise of condom use signify positive male attitude towards family planning, who were always dominant in decision making pertaining to women's fertility and birth spacing in Pakistan[4]. It shows that how important is the role of male partner in family planning. So the proper participation of a male partner is also required in family planning. In another study it was suggested that the provision of family planning advice and supplies at the doorstep of women increases contraceptive use[16]. We are fully agreed with this suggestion because females in our country are very much shy to take advices regarding family planning so if the female lady health workers provide the advices and contraceptives like condom at their doorsteps it would bring amazing results.

Douthwaite and Ward[17] (2005) in national evaluation of lady health workers programme found that lady health workers succeeded in raising contraceptive uptake in rural Pakistan. Another national survey revealed that married women living within 5km of two community-based workers were significantly more likely to use modern reversible methods than those with no access[18]. Numerous studies have demonstrated a strong association between quality of care and uptake of contraceptive methods[19-20]. This study found that 50.4% of the subjects had some fear regarding the use of contraceptives which reflects their poor knowledge regarding, use, efficacy and safety of contraceptives. Similar weaknessess were highlighted in a study from Karachi[21].

It is need of the time to plan a family according to the resources otherwise it would be a burden not only for the family but also for the society and country.

Conclusion

This study found that the awareness regarding contraception in this region of study is good but practice of contraceptives as compared to awareness is low, so there is wide gap between knowledge and practice. There are many factors implicated regarding its low practice in this region like illiteracy, fear regarding use of contraceptives, social and religious constraints. It is suggested that by improving literacy level, by clarifying their misconceptions, by educating husband and families regarding contraception and giving them clear information may further improve use of contraception in our country.

Recommendations

There should be more effective lady health workers program to provide knowledge of family planning to the people that can bring this knowledge into practice.

References

1. U.S Census Bureau, International Population Reports WP/02, Global Population Profile: 2002; U.S. Government Printing Office, Washington, DC, 2004. http://www.census.gov/prod/2004pubs/wp-02.pdf.
2. Population Reference Bureau 2006, World Population Data Sheet. www.prb.org/pdf06/06WorldData Sheet .pdf
3. Population policy of Pakistan. Ministry of population welfare, Government of Pakistan, Islamabad, July 2002.
4. Casterline JB, Sathar AZ, Haque MU. Obstacles to contraceptive use in Pakistan: a study in Punjab. Stud Fam Plann 2001;32:95-110.
5. Shah NA, Nisar N, Qadri MH. Awareness and pattern of utilizing family planning services among women attending Urban Health Care Center Azizabad Sukkur. Pak J Med Sci 2008;24:550-5.
6. Usmani RA, Manzoor S. Family planning services; role of socioenomic factors in utilization. Professional Med J 2006;13:587-90.
7. Pakistan's population: Statistical profile 2002. Population Association of Pakistan.
8. Bibi S, Memon A, Zehra M, et al. Contraceptive knowledge and practices in two districts of Sindh, Pakistan. J Pak Med Assoc 2008:58-5.
9. Ali S, White FM. Family planning practices among currently married women in Khairpur District, Sindh, Pakistan. J Coll Physicians Surg Pak 2005; 15:422-5.
10. Khawaja NP, Tayyab R, Malik N. Awareness and practices of contraception among Pakistan women attending a tertiary care hospital. J Obstet Gynaecol 2004; 24:564-7.
11. Saleem S, Bobak M. Women's autonomy, education and contraception use in Pakistan: a national study. Reprod Health 2005;2:8.
12. Haider G, Perveen G, Rani S, et al. Family planning practices and its awareness among multiparous women. Rawal med J 2009;34:183-6.
13. Hakim A, Cleland J, Bhatti M. Main Report, Pakistan fertility and family planning survey 1996 - 1997.

Grady RW, Klepinger DH, Billy JG, et al. The role of relationship power in couple decision about contraception in the US. J Biosoc Sci 2010;42:307-23.

Bhatia J, Cleland J. Determinants of maternal care in a region of south India. Health Transition Review 1995; 5:127-42.

Hossain MB. Analyzing the relationship between family planning worker's contact and contraceptive switching in rural Bangladesh using multilevel modelling. J Biosoc Sci 2005; 37:529-54.

17. Douthwaite M, Ward P. Increasing contraceptive use in rural Pakistan: an evaluation of the Lady Health Worker Programme. Health Policy Plann 2005; 20:117-23.

18. Sultan M, Cleland JG. Ali MM. Assessment of a new approach to family planning services in rural Pakistan. Am J Public Health 2002; 92: 1168-72.

19. Hamid S, Stephensen R. Provider and health facility influences on contraceptive adoption in urban Pakistan. Int Fam Plann Perspect 2006;32: 71-8.

20. Magnani RJ, Hotchkin DR, Florence CS, et al. The impact of the family planning supply environment on contraceptive intentions and use in Morocco. Stud Fam Plann 1999;30:120-32.

21. Fikree FF, Saleem S, Sami N. A quality of care issue: appropriate use and efficacy knowledge of five contraceptive methods: views of men and women living in low socio-economic settlements of Karachi, Pakistan. J Pak Med Assoc 2005;55: 363-8.

ORIGINAL ARTICLE

Dengue fever outbreak among children in Karachi: experience at a tertiary care children hospital

Abdul Ghaffar Nagi, Raffat Murad, Mukhtiar Baig

Abstract

Objective: To study the natural history of disease in terms of clinical presentation and outcome in hospitalized children with confirmed dengue cases.

Methods: A case series study was conducted at National Institute of Child Health (NICH), Karachi from September through November 2006. Children presented with fever and presence of at least 2 clinical manifestations of suspected dengue infection according to WHO criteria were included in study. Patients were followed regarding clinical presentation, investigations, management and outcome.

Results: A total of 152 children admitted with suspicion of having dengue fever were evaluated in the study. Dengue fever antibody IgM tested on all suspected patients along with CBC, PT/aPTT, Blood C/S, Serum protein and chest X- ray. Dengue fever IgM was positive in 111 patients. A significant majority of dengue patients belonged to peri urban slums. Common presenting symptoms among dengue patients was fever (100%), rash (71.17%), vomiting (52.25%), hemorrhagic manifestation (36.03%) and fits (5.40%). Among 111 dengue positive cases 65 (58.58%) were Dengue Fever (DF) cases, 40 (36.03%) were Dengue Hemorrhagic Fever (DHF) and 6 (5.40%) were cases of Dengue Shock Syndrome (DSS). Three patients expired during their stay in hospital.

Conclusion: A high percentage of dengue positive cases among suspected patients and a significant proportion of dengue hemorrhagic fever and dengue shock syndrome cases demands careful investigation and management.

Key words: Dengue Fever, Dengue Hemorrhagic Fever, Dengue Shock Syndrome

Introduction

Dengue infection has become a major international health problem as its global prevalence has increased substantially in recent decades.[1, 2] According to World Health Organization, more than 2.5 billion people are at risk of developing dengue infection.[3] There is world wide occurrence of about 50 – 100 million cases of dengue infection, 500,000 cases of Dengue Hemorrhagic Fever (DHF) and about 12000 deaths every year due to dengue infection. The case fatality rate of Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) is around 5%.[3] In Pakistan, Dengue infection was first documented in 1982 from Punjab province in 12 patients out of sample of 174.[4] First major epidemic in Southeast Asia was reported from Srilanka in 1989.[7] The first major outbreak of dengue fever was reported in Karachi in 1994 – 95.[8] According to Provincial Dengue Fever Surveillance Cell, Ministry of Health, Government of Sindh, total of 4251 cases of dengue fever were diagnosed among admitted patients in different hospitals of Karachi during 2005 – 2009.[2] Dengue fever is an acute infectious disease caused by arbovirus in the flavivirus genus. Four viral serotypes exists (DEN – 1, DEN – 2, DEN – 3 and DEN – 4). Infection with one serotype confers long immunity against that particular serotype only with very little cross immunity. In fact infection with another serotype the next time round may well lead to DHF and DSS.[9-10] The virus is transmitted to susceptible humans by bites of Aedes aegypti and Aedes albopictus mosquito species found world wide.[11-13] But most of the dengue infection cases occur in tropical and subtropical regions, particularly in urban and semi urban areas. Temperature, humidity and rainfall are crucial with respect to reproduction of vector, its survival and infectiousness.[14]

The incubation period of dengue fever is 3 – 14 days.[15] The manifestation of illness ranges from sudden onset of fever, headache, conjunctival injection, flushed facies, retrobulbar headache, backache, muscle and bone pain, malaise, lymphadenopathy, nausea, vomiting and sore throat. There is loss of appetite with bad taste. Fever may last for 2 – 7 days. A transient skin rash may be present. There may be skin hemorrhages, nasal bleeding, heavy menstrual period or GIT bleeding. A patient is suspected to have dengue fever if there is thrombocytopenia, hemoconcentration and elevated ALT and AST.[16 - 20] For conformation of dengue fever cases, IgM antibody test is performed after 7 days of onset of symptoms.[2] A small percentage of patients with secondary infection may show no detectable IgM antibody.[21, 22] Dengue fever has no specific treatment and is usually self limiting. Symptomatic treatment should be provided with avoidance of aspirin, NSAID and antibiotics. Patients should remain under the cover of nets through out period of infectivity. They should be well hydrated. Intravenous fluids should be given who have severe vomiting or can not maintain oral intake. Platelet

✉ Abdul Ghaffar Nagi

Pediatrics Department, International Islamic University of Malaysia (IIUM), Ex- Professor of Pediatrics BUMDC and Ex-Director NICH, Karachi. Email:nagi_007pk@yahoo.com

Raffat Murad, Department of Biochemistry, Bahria University Medical & Dental College, Karachi.

Mukhtiar Baig, Department of Biochemistry, Bahria University Medical & Dental College, Karachi.

Received October 07, 2011, Revised November 10, 2011 Accepted November 20, 2011

infusions are required when platelets fall below 20,000/cmm.[9]

Subjects and Methods

This descriptive case series study was conducted at National Institute of Child Health (NICH), Karachi from September 2006 till November 2006. Children reported with acute febrile illness of 2 – 7 days duration with 2 or more of clinical features according to WHO criteria as shown in table I were included in the study. Children of known hematological disorder, malignancy, acutely managed for fever and shock were excluded. Total of 152 patients suspected of dengue fever were tested for CBC, PT/aPTT, Blood C/S, Serum proteins, Chest X – Ray, Dengue IgM antibody (tested after at least one week of clinical presentation). The demographic, epidemiological data clinical features, management and outcome were recorded.

Table- 1 WHO criteria for diagnosis of Dengue fever, Dengue hemorrhagic fever, Dengue shock syndrome, probable Dengue Fever (DF)

Acute febrile illness with at least 2 following manifestations.

1- Headache 2- Retro-orbital pain
3- Myalgia 4- Arthralgia
5- Rash 6- Hemorrhagic manifestation
7- Leucopenia and supportive serology or occurrence at the same location and time as other confirmed cases.

Confirmed DF: isolation of dengue virus, 4- fold or greater change in antibody titres, demonstration of the dengue virus antigen or genomic sequence

Dengue Hemorrhagic Fever (DHF):
All of the following should be present.

1- Confirmed dengue fever through laboratory
2- Fever for 2 – 7 days
3- Bleeding evidenced by at least one of the following
   a) Positive tourniquet test (TT)
   b) Petechiea, ecchynosis or purpura
   c) Bleeding from mucosa, GIT, injection sites or other
   d) Haemetemesis or melena
   e) Thrombocytopenia
4- Evidence of plasma leakage due to increased vascular permeability manifested by at least one of the following.
   a) Rise in hematocrit ≥ 20% above average for age, sex, population
   b) Drop in hematocrit following volume replacement treatment ≥ 20%
   c) Signs of plasma leakage e.g pleural Effusion, ascites, hypoproteinemia

Dengue Shock Syndrome (DSS)

1- Four criteria of DHF plus
2- Signs of circulatory failure manifested as
   a) Rapid and weak pulse
   b) Narrow pulse pressure
   c) Hypotension for age (Systolic pressure < 80mmHg for < 5 years, < 90mmHg for > 5 years
   d) Cold clammy skin
   e) Restlessness

Results

During the study period from September 2006 to November 2006, total of 152 suspected patients of dengue infection were admitted in NICH Karachi. After investigations 111 (73%) of these patients were diagnosed as dengue positive cases on the basis of IgM antibody performed after at least one week of appearance of clinical manifestations. Among dengue positive cases (n=111) males were 53(47.74%) while females were 58(52.25%). Age distribution of these 111 patients is shown in Fig 1.

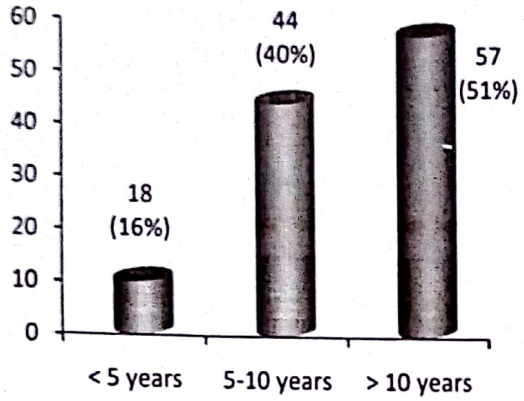


Figure - 1 Age distribution of dengue positive cases (n=111)

Table 2 shows different residential areas from where these children were reported and common sign and symptoms of these patients is shown in Fig 2.

Among 111 admitted patients of dengue confirmed cases 65 patients (58.55%) were diagnosed as Dengue fever while 40 patients (36.03%) as Dengue Hemorrhagic Fever and 6 (5.40%) as Dengue Shock Syndrome on the basis of WHO criteria as shown in table I.

Treatment provided to patients was symptomatic and supportive. It included paracetamol, ointments and I/V fluids. Platelet concentrates in case of hemorrhage and fresh frozen plasma if PT/aPTT was disturbed. Patients with hemoglobin less than 7gm/dl received red cell concentrate in whole blood transfusion. Three patients (2.7%) died due to prolonged shock. Rests of patients were discharged after clinical improvement. Average duration of stay in hospital was 6 days.

Table-2 Area-wise distribution of dengue patients

	Area of residence	No. of patients
1	Malir	42
2	Orangi Town	18
3	Korangi	15
4	Landhi	14
5	Gulistan e Johar	7
6	Nazimabad	4
7	Defence	2
8	Thatta	3
9	Moro	2
10	Umerkot	1
11	Tando Adam	1
12	Baluchistan	2
	Total	111

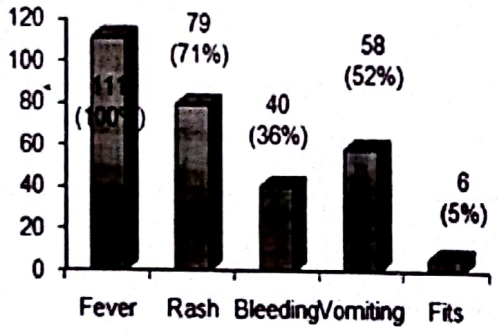


Figure- 2 Common sign and symptoms of dengue cases (n=111)

Discussion

Though dengue fever has been recognized as one of the causes of fever for a long period of time in Karachi, but its first major outbreak occurred in 1994-95. In a study conducted in Karachi from 2005-2009 it was revealed that most of dengue fever cases occurred in the months of September through November.[2] Karachi receives most of its rain in July and August. The stagnant water helps in breeding of vector responsible for most of cases to occur after monsoon rains in Karachi.

During this study period from September to November 2006, total of 152 suspected patients of dengue fever were admitted in NICH, Karachi. Majority of children were brought from Malir, Orangi Town, Korangi and Landhi areas which are periurban slums. These areas have inadequate facilities for solid and waste management. Similar findings were reported in a study conducted in the same year in Civil Hospital Karachi(CHK) and Liaquat National Hospital (LNH), Karachi showing that vast majority of dengue patients belonged to periurban areas of Karachi.[23] Another study conducted in Aga Khan University Hospital (AKUH), Karachi in 2006 reported a different pattern where urban and central parts of Karachi showed higher frequency of cases.[24] This could be because AKUH is a private and comparatively expensive hospital where less patients reports from slum areas.

This study observed slight female preponderance among understudy patients. Most of the studies conducted on children reported slight male preponderance of dengue fever.[8,23] Other studies conducted on adult population mostly observed clear higher frequency of male involvement in dengue fever.[1,24,25,26] A higher male ratio among adult population could be because adult males works and spend considerable time outside their homes and thus are more vulnerable to mosquito bites. Among children, this habit is less appreciable. Same reason could be the contributing factor in less cases among children under five years of age as they usually have a minimum exposure to outside. Similar findings were reported by other studies.[27, 28]

The most common symptom in the study group was fever, present in all understudy 152 patients. There are bimodal peaks of fever usually encountered among children.[3] Previous studies also reflect fever as the main finding in all dengue epidemics.[23] Rash was another significant clinical presentation present in 71% positive cases of dengue fever. A study conducted in Jinnah Post Graduate Medical Centre in 2007 – 2008 reported rash in more than 81% cases.[29] Ahmed et al[1] (2008) in their study conducted in Combined Military Hospital, Malir Cant reported 65% cases of dengue fever presented with rash, Singh et al[30] (2005) in their study found 20% patients of dengue infection with rash. Vomiting is an another common symptom in dengue fever. Vomiting was present in 52.25% understudy cases. Ahmed, et al[1] (2008) reported 47%, Ahmed, et al[23] (2008) 68%, Abbasi, et al[29] (2009) 78.57% whereas Singh et al[30] (2005) reported 50.8% cases of dengue with vomiting. Our study showed a higher occurrence of DHF which was 36.03% compared with study conducted in AKUH which showed 29.49% cases of DHF but it is much lower than combined study of CHK and LNH which was 62% cases. The overall mortality in our sample of proven dengue fever was 2.7%. Studies conducted in epidemic of 2006 in Civil Hospital Karachi reported 3% and study at AKUH Karachi conducted in same year showed 2% mortality due to dengue infection. [23,24]

Conclusion

The frequency of dengue fever confirmed by specific IgM antibody among suspected dengue cases was 73%. Majority of cases reported from periurban slums after monsoon rains. A significant proportion (41.43%) of dengue cases belonged to DHF and DSS.

References

1. Ahmed S, Ali N, Ashraf S,et al. Dengue fever outbreak: A Clinical management experience. JCPSP 2008;18:8-12.

2. Qadir M, Murad R, Aziz N, et al. Pattern of Dengue fever in different weather conditions of Karachi. Infect Dis J Pak 2011; 20:329-32.

3. World Health Organization. Prevention and control of dengue and dengue hemorrhagic fever comprehensive guidelines. WHO Regional Publication SEARO No.29;1999.

4. World Health Organization. Scientific working group on Dengue. Meeting report, Geneva, Switzerland, 3-5 April 2000. Geneva: WHO;2000:5.

5. Halstead SB, O'Rourke EJ. Dengue viruses and mononuclear phagocytes. Infection enhancement by non- neutralizing antibody. J Exp Med 1977;146:201-17.

6. Hayes CG, Baqar S, Ahmed T,et al. West Nile virus in Pakistan. Sero epidemiological studies in Punjab Province. Trans R Soc Trop Med Hyg. 1982;76:431-6.

7. Ansari JK, Siddiqi M, Hussain T,et al . Outbreak of Dengue haemorrhagic fever in Karachi. Pak Armed Forces Med J 2001;51:94-8.

8. Qureshi JA, Notta NJ, Salahuddin N, et al. An epidemic of Dengue fever in Karachi, associated clinical manifestations. J Pak Med Assoc 1997;47:178-81

9. Ahsan T. Dengue Fever: a regular epidemic? (Editorial).J Pak Med Assoc 2008; 58:1-2.

10. Chaudhary R, Khetan D, Sinha S, et al. Transfusion support to dengue patients in a hospital based blood transfusion services in north India. Tranfus Apher Sci 2006;35:239-44.

11. Lanciotti RS, Calisher CH, Chang GJ,et al. Rapid detection and typing of dengue viruses from clinical samples by using reverse transcriptase – polymerase chain reaction. J Clin Microbiol 1992;30:545-51.

12. Guha–Sapir D, Schimmer B. Dengue fever: paradigm for a changing epidemiology: Emerg Themes Epidemiol 2005;2:1.

13. Gibsons RV, Vaughan DW. Dengue: an escalating problem. BMJ 2002;1563-6.

14. McMichael AJ. Haines A, Sloot R, et al., editors. Climate change and human health. Geneva: WHO,WMO,UNEP;1996.

15. Qureshi FA. Dengue (Break bone fever). In: Ilyas M, editor. Public Health and Community Medicine. 7th ed. Karachi: Time Publishers;2006:533-4.

16. Bult N, Abbassi A, Munir SM,et al. Haematological and biochemical indicators for the early diagnosis of dengue viral infection. JCPSP 2008;18:282-5.

17. Sung V, O'Brian DP, Matchet E, et al. Dengue fever in travelers returning from South east Asia. J Travel Med 2003;10:208-13.

18. Akram DS, Igarshi A. Dengue virus infection among children with undifferentiated fever in Karachi.

Infect Dis J 2000; 9:10-14.

19. Rong–Fuche, Kuender DY. Different Clinical and laboratory manifestations between dengue hemorrhagic fever and dengue fever with bleeding tendency. Trans R Soc Trop Med Hyg 2007;101:1106-13.

20. Ayub M, Khazindar AM, Lubbad EL,et al. Characteristics of dengue fever in a large public hospital, Jeddah, Saudi Arabia. J Ayub Med Coll 2006;18:9-13

21. Guzman MG, Kouri G. Dengue diagnosis, advances and challenges. Int J Infect Dis 2004;8:69-80.

22. De Paula SOD, Fonceca BA. Dengue: a review of the laboratory tests, a clinician must know to achieve a correct diagnosis. Braz J Infect Dis 2004;8:390-8.

23. Ahmed S, Arif F, Yahya Y,et al. Dengue fever outbreak in Karachi 2006 – A study of profile and outcome of children under 15 years of age. J Pak Med Assoc 2008;58:4-8.

24. Riaz MM, Mumtaz K, Khan MS, et al. Outbreak of dengue fever in Karachi 2006: a clinical perspective. J Pak Med Assoc 2009;59:339-44.

25. Ratho RK, Mishra B, Kaur J, et al. An outbreak of dengue fever in periurban slums of Chandigarh, India with special reference to entomological and climatic factor. India J Med Sci 2005;59:518-26.

26. Vijayakumar TS, Chady S, Satish N, et al. Is Dengue emerging as a major public health problem? Indian J Med Res 2005;121:100-7.

27. Ram S, Khurana S, Kausal V, et al. Incidences of dengue fever in relation to climatic factors in Ludhiana, Punjab. Indian J Med Res 1998;108:128-33.

28. Victor TJ, Malathi M, Guruswamy D, et al. Dengue fever outbreak in two villages of Dharamapuri: District in Tamil Nadu. Indian J Med Res 2000;116:133-9.

29. Abbasi A, Butt N, Sheikh QH, et al. Clinical features, diagnostic techniques and management of dual dengue and malaria infection. JCPSP 2009;19:25-9.

30. Singh NP, Jhamb R, Agarwal SK, et al. The 2003 outbreak of dengue fever in Delhi, India. Southeast Asian J Trop Med Public Health 2005;36:1174-8.

REVIEW ARTICLE

Molecular basis of human essential hypertension

Sadiqa Syed, Masood A Qureshi

Abstract

Essential hypertension (HTN) affects over one billion people worldwide. It is a complex, multifactorial, quantitative trait under polygenic control resulting from inheritance of a number of susceptibility genes and involves multiple environmental determinants in different combinations in different individuals. The completion of the draft sequence of human genome and recent advances in the genetics have resulted in identification and characterization of various genetic mechanisms that associate increased blood pressure and cardiovascular risk factors. The possible molecular mechanisms involved in homeostasis, ranging from locally acting vasoactive peptides to components of rennin angiotensin aldosterone system to epithelial sodium channels and sodium chloride transporters have been discussed. Several vasoregulatory systems including sympathetic vasoregulation and cytokines release have been studied extensively. Despite all these efforts of identification of numerous candidate genes in different ethnic populations using different approaches and technologies, the results are still inconsistent and the genetic and molecular basis of HTN remains unclear.

In view of rapid availability of useful data on various aspects of Physiology and genetics of HTN, it is pertinent to review such information focusing on association of well known candidate genes with various facets of HTN and their physiological regulatory processes. Thus HTN related risk factors, known to have interactions with genes are highlighted in this article.

Key words: genome, locus, hypertension, candidate genes

Introduction

Hypertension (HTN) is defined as a systolic blood pressure (BP) of 140 mmHg or higher or a diastolic BP of 90 mmHg or higher at the age of 20 years, and 160/95 mmHg at the age of 50 years[1]; however the Joint National Committee of World Health Organization on prevention, detection, evaluation and treatment of high BP have defined two stages of HTN in its 7th report. Stage I comprises systolic BP between 140-159 mmHg and diastolic BP between 90-99 mmHg; whereas stage-II with systolic BP >160 mmHg and diastolic>100 mmHg [2]. In majority of cases, a specific underlying cause of HTN is not found and they are said to have essential HTN. Essential HTN is one of the major public health problems in many countries due to its high prevalence and its association with coronary heart disease (CHD), stroke, renal disease, peripheral vascular disease and other disorders. [3]

HTN affects 28% of adult population in North America, 40% in Western countries, 25% in far East region, 15% in SAARC countries and 26% in EMRO region [4]; the prevalence and severity varies markedly with age and some estimates suggest that as many as 90% of adults will suffer from systolic HTN by the age of 80[5]. In Pakistan there are 12.5 million diagnosed cases of HTN and 12,000 die every year because of complications of this disease.

✉ **Sadiqa Syed**

Prof & Head Department of Physiology, Bahria University Medical & Dental College, Karachi.
Email: sadfar07@yahoo.com

Masood A Qureshi
Prof & Head Department of Physiology and Director Post Graduate Research Program DUHS, Karachi.

Received June 13, 2011, Revised September 10, 2011 Accepted November 09, 2011

Risk factors

HTN is a multi-factorial disorder, which results from the inheritance of a number of susceptibility genes and involves multiple environmental determinants. Existing evidences suggest that the genetic contribution to BP variation is about 30-50% [6]. Although a number of candidate genes have been studied in different ethnic populations, results from genetic analyses are still inconsistent and specific causes of HTN remains unclear. The genetic basis of HTN is complex, and the examination of functional consequences of genetic variations in particular is still challenging.[7]

Molecular and genetic medicine has challenged the supremacy of the physiological approach that has dramatically contributed to the unprecedented progress that clinical medicine has seen during the second half of the 19th and throughout the 20th century. Elaborated knowledge of physiology of sympathetic nervous system, kidney, renin angiotensin system (RAAS) etc, led to a progressive understanding of the mechanism of HTN and to the development of an array of effective BP lowering drugs making HTN a controllable disease.[8]

Many familial studies have demonstrated that about 30% of BP variance is considered to be genetically determined. Data from animal models and human population studies suggest that inherited genetic factors influence 50% of variation in BP level and that different genes affect at different ages. A few twin studies and segregation analyses have documented 30-50% variation of BP as heritable, suggesting multiple genes are involved in susceptibility to HTN, with modulation of their effects by gene-gene and gene-environmental interactions emphasizing the role of environmental factors in initiating or perpetuating the progress of HTN in humans. [9] The environmental factors seem to act only in genetically susceptible

persons. Genomic analyses for HTN even in relation to lifestyle have also been reported.[10]

Essential HTN is of unknown etiology but it is a complex interplay of genetic, environmental and other factors such as lifestyle variables, obesity, dietary salt intake, smoking, alcohol consumption and physical inactivity.[11, 12]

Molecular and genetic aspects of human HTN

Mendalian HTN (single gene)

A number of methods have been successfully used to identify mutations that cause Mendalian traits including some rare, inherited forms of HTN for which single genes are known to be involved e.g. Liddle's syndrome. Studies on Mendalian HTN has provided better understanding of etiological mechanisms including synthesis and degradation of mineralocorticoids and their receptors, sodium channel resorptive mechanisms and regulation of thiazide-sensitive sodium chloride co-transporter.[13]

Renal sodium handling is an essential physiological function for body fluid maintenance and BP regulation. Kidney specific sodium transporters in the renal tubule have been identified. Genes that regulate RAAS play a role in all aspects of BP control including radius of blood vessels and sodium and water balance. In this connection, genetic studies in general Japanese population suggested the importance of Mendalian HTN genes in genetic investigation of essential HTN.[14]

Increased peripheral resistance primarily due to changes in vascular structures and function is the major fundamental, hemodynamic abnormality. Multiple interacting humoral and mechanical factors as well as oxidative stress stimulate complex signaling pathways, which modulate vascular smooth muscle cell contraction and growth. Under normal physiological conditions, these finely tuned regulated processes maintain cell wall integrity and prevent pathological increase in BP. However under abnormal conditions increased humoral and mechanical signaling results in vascular wall thickening and increased vascular tone, which play an important role in pathogenesis and maintenance of HTN.[15]

The investigations of Mendalian disorders have identified more than 100 candidate genes in different ethnic population which provide evidence of linkage with HTN. However these genetic analyses are mostly inconsistent and have small contribution in some rare forms of HTN. Glucocorticoid remediable aldosteronism, apparent mineralocoricoid excess and mutation in the mineralocorticoid receptor gene have brought useful information about minearlocorticoid-induced HTN.[16]

Multiple gene screening for HTN

Two largest genome scans for BP i.e. Family Blood Pressure Program (FBPP) and the British Genetics of Hypertension Study (BRIGHT) have identified new loci having significant linkages in almost every chromosome; whereas association studies have implicated more than 66 genes, but virtually all failed to show consistent replication in other settings.[17]

From the analysis of data on the genetic basis of BP control, it appears that several dozen genes with modest individual effects are intervening in the regulation of BP. Most of these genes encode proteins that either mediate or are involved in the control of renal sodium handling. Several genes encoding proteins that exert a direct or indirect effect on sodium homeostasis have been located in more convincing loci (1q, 2p, 2q, 4q, 6q, 12q, 17q).[14] The sensitivity of an individual will depend on the functional interactions between these genes and on interactions with several environmental factors. A genome wide scan performed in Scandinavian sib-pairs identified HTN susceptibility loci on chromosome 14, and 2.[18] Another study identified 54 markers as potential HTN susceptibility loci by three-steps screening of three independent case-control populations. A study on adult nuclear families that included monozygotic and dizygotic twins showed that genetic and shared environmental components accounted for 64% and 31% of total variance in systolic BP respectively.[14]

Hypertension Genetic Epidemiology Network have indicated regions for BP traits together with several coincident regions for phenotypically correlated traits including systolic BP response to a postural challenge and body mass index. Thus HTN susceptibility arises from the actions of multiple genome sequence variations.[19]

Meta analysis of genome-wide scan for BP

Follow up studies in African-American and Nigerian samples involving positional cloning efforts of the combined families showing linkage evidence in 2p regions need verification for precise identification.[20] A study on a Chinese population failed to find any support for a significant contribution of five candidate genes (lipoprotein lipase, leptin, leptin receptor, alpha adducin & beta-3 adrenergic receptor) to the pathogenesis of essential HTN.[21]

The human renin is an attractive candidate for involvement in the underlying cause of HTN; thus a study in Japanese population suggested that the mis-sense mutation in exon 9 may affect the enzymatic function of renin and consequently may be involved in etiology of HTN. [22] Genome scan among Nigerians found linkage signals for systolic BP on 19p & 19q and for diastolic BP on 2p, 3p, 7p, 7q and 10q; however

accumulated data may indicate in particular 2p, 3p and 19p. Genome scans reported significant candidate genes on chromosome 14 and 2 and 12. [23]
When main findings of all human genome scans were summarized, it was observed that all human chromosomes except 13 and 20 have BP, HTN or pre-eclampsia loci. Chromosomes 1, 2, 8, 11, 12, 15, 16, 18, and 19 have regions that have been found in more than one study yielding some consistent encouraging support for BP loci.[24]

Future Perspective

There are great expectations for the future with regards to advancements in transcriptomics, proteomics and application of physiogenomic and newly emerging epigenomic approaches to hypertension research, that promises to provide deeper insight into genetics and physiology of BP regulation and hence hypertension.

References

1. Vasan RS, Beiser A, Seshadri S, et al. Residual life time risk for developing hypertension in middle aged men and women; The Framingham Heart Study. JAMA 2002; 287: 1003-10

2. Chobanian M. The 7th Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure. JAMA 2003; 289: 2562-74.

3. Gong M, Hubner M. Molecular genetics of human hypertension. Clin Sci 2006; 110: 315-26.

4. Kearney PM, Whelton M, Reynold K et al. Global Burden of Hpertension: analysis of world wide data. Lancet 2005; 365: 217-23.

5. Kotlitkoff M, Hall I. Hypertension: β testing. J Clin Invest 2003;112:654-6.

6. Marteau JB, Zaiou M, Siest G et al. Genetic determinants of blood pressure regulation. J Hypertens 2005; 23: 2127-43.

7. Hubner N, Yagil C, Yagil Y. Novel integrative approaches to the identification of candidate genes in hypertension. Hypertension 2006;47:1-5.

8. Zanchetti A. The basic importance of the physiological approach in clinical medicine: the experience in the area of hypertension. Arch Ital Biol 2005;143: 97-102.

9. Coy V. Genetics of essential hypertension. J Am Acad Nurse Pract 2005; 17: 219-24.

10.Tetsuro M. Advanced genomic analysis for hypertension. Tanpukushitsu Kakusan Koso 2005; 50: 2090-6.

11. Mondry A, Loh M, Liu P et al. Polymorphism of the insertion/deletion ACE and M235T AGT genes and hypertension: surprising new findings and meta analysis of data. BMC Nephrology 2005;6:1.

12. Kobashi G. Genetic and environmental factors associated with the development of hypertension in pregnancy. J Epidemiol 2006; 16:1-8.

13. Luft FC. Present status of genetic mechanisms in hypertension. Med Clin North Am 2004; 88:1-18.

14. Meneton P, jeunemaitre X, de-Wardener HE et al. Links between dietary salt intake, renal salt handling, blood pressure and cardiovascular disease. Physiol Rev 2005; 85:679-715.

15. Touyz RM, Schiffrin EL. Signal transduction mechanisms mediating the physiological and pathophysiological actions of angiotensin II in vascular smooth muscle cells. Pharmacol Rev 2000; 52:639-72.

16. Luft FC. Mendalian forms of human hypertension and mechanisms of disease. Clin Med Res 2003;52: 639-72.

17. Munroe PB, Wallace C, Xue MZ, et al. Increased support for linkage of a novel locus on chromosome 5q13 for essential hypertension in the British Genetics of Hypertension Study. Hypertension 2006;48:105-11.

18.Von Wowern F, Bengtsson K, lindgren CM, et al. A genome-wide scan for early onset primary hypertension in Scandinavians. Hum Mol Genet 2003 ;12: 2077-81.

19. McBride MW, Grahem D, Delles C, et al. Functional genomics in hypertension. Curr Opin Nephro Hypertens, 2006;15:145-51.

20. Rice T, Cooper RS, Wu X, et al. Meta analysis of genome-wide scan for blood pressure in African American and Nigerian samples. The National Heart Lung and Blood Institute Gene Link Project. Am J Hypertens, 2006;19:270-4.

21. Zhu DL, Wang HY, Xiong MM, et al. Linkage of hypertension to chromosome 2q14-q23 in Chinese families. J Hypertension 2001;19:56-61.

22. Tiago AD, Badenhorst D, Nkeh B, et al. Impact of renin angiotensin aldosterone system gene variants on the severity of hypertension in patients with newly diagnosed hypertension. Am J Hypertens 2003;16: 1006-10.

23. Cooper DN, Nussbaum RL, Krawczak M. Proposed guidelines for papers describing DNA polymorphism-disease association. Human Genet 2002;110:207-8.

24. Mein CA, Caulfield MJ, Dobson RJ, et al. Genetics of essential hypertension. Hum Mol Genet 2004;13:R169-75.

Objective structured clinical examination: an overview

Mukhtiar Baig, Nazish Fatima, Sobia Ali

Abstract

Objective Structured Clinical Examination (OSCE) is gaining wide-spread recognition as a means of assessing the clinical skills and other aspects of competence of health professionals. OSCE is rapidly replacing other forms of assessment at all levels of medical and health professional education. Since its development its use has become widespread as the standard for performance based assessment, particularly in undergraduate examinations. OSCE has been in practice in many parts of the world with favorable outcomes and has proven to be a reliable and valid assessment tool. It has been adapted to assess multiple skills like physical examination, history taking, communication skills, technical skills and interpretation of laboratory results, radiographs and ECG etc. The use of more complex cardiovascular simulators and anatomical models has further expanded the skills that can be tested by OSCE. Although it demonstrates certain advantages over other forms of assessment but has proved to be labor-intensive and time consuming. At present it is successfully being used in Pakistan for undergraduate and postgraduate examinations at various medical schools.

Key words: OSCE, validity, reliability, standard setting

The assessment of student's clinical competence is of utmost importance and there are several means of evaluating student performance in medical examination. The Objective Structured Clinical Examination (OSCE) is an approach in which different aspects of clinical competence are evaluated in a comprehensive, consistent and structured manner[1]. Since its development its use has become widespread as the standard for performance-based assessment, particularly in undergraduate examinations. In fact it can be considered as one of the four major teaching innovations in the last five decades that have had a great impact in medical education[2].

What is an OSCE?

An OSCE is a series of timed (5 to 10 minutes) stations (ranging from 8 up to more than 20) through which examinees are assessed by one or more examiners while performing a standardized clinical task during a patient examination or standardized patient interaction using a well-defined structured marking sheet[3-4]. The clinical task can be history taking, clinical examination, data interpretation, management, communication skills, counseling, and technical skills. Marking is done using a task-specific checklist, rating scale, or a combination of both[5].

The OSCE was first described by Harden & Gleeson[6] (1979) as, "timed examinations in which medical students interact with a series of simulated patients in stations that may involve history-taking, physical examination, counseling or patient management".

The use of OSCE not only makes the process objective but also addresses the assessment of all three domains (cognitive, affective and psychomotor) at one point[7-8].

OSCEs have been shown to be feasible and have good reliability and validity so their use has become widespread as the standard for performance-based assessment, particularly in undergraduate examinations. The OSCE was one of the first performance-based examinations to be used in assessing physicians' competence and is now considered the prototype of performance-based assessment in medicine[1].

Over time, the OSCE has been adapted to assess multiple skills: physical examination skills; interpretation of radiographs, ECGs, and laboratory results as they relate to a patient encounter; communication skills; technical skills; and teaching skills. The use of anatomical models, heart sound simulators and more complex cardiovascular simulator has further expanded the skills that can be tested[9].

How to organize an OSCE?

Marks & Humphrey[1] (2009) have described the following steps to organize the OSCE exam:

OSCE- Planning Checklist

Exam Content
- Blueprint
- Recruit case Authors
- Finalize case content

Standard setting
- Decide on pass marks

Standardized patients
- Recruitment
- Training

Logistics
- Location of the exam
- Number of tracks required
- Staff

✉ **Mukhtiar Baig**

Department of Biochemistry/DME, Bahria University Medical and Dental College, 13-National Stadium Road, Karachi.
Email: drmukhtiarbaig@yahoo.com

Nazish Fatima, Department of Anatomy/DME, Bahria University Medical and Dental College, Karachi.

Sobia Ali, Department of Anatomy/DME, Bahria University Medical and Dental College, Karachi.

Received July 02, 2011, Revised September 10, 2011 Accepted October 20, 2011

- Equipment and models

Examiner
- Recruitment
- Training

Budget
- Administrative staff
- Examiner
- Standardized patients
- Food
- Equipment
- Site

Post- exam review
- Feedback on cases and process from
  - Student
  - Examiner
  - Administrative staff
- Review of pass marks
- Recommend changes to stations

How to develop case/scenarios

Content experts, who are involved in the training program, should write the OSCE case. Case authors should be provided with a specific skill and domain of practice to be assessed and asked to base their case on an actual patient encounter. The authors are asked to provide the following components for each case[1]:

a. Define the purpose of the stations
b. Clear and concise instructions to candidates
c. Comprehensive scoring checklist
d. Detailed standardized patients instructions
e. Detailed instructions for station set-up

Standard setting: Pass or fail decision?

Setting standards (setting defendable passing score and grades) on an examination has enormous importance and requires the use of systematic methods. Standards need to be set by experienced, unbiased, and qualified judges. Using two or more groups of judges for the rating allows for measuring the agreement between their ratings (reliability) and increases the credibility of the standards[10].

Standard setting for OSCEs involves choosing a pass/fail or cut score that represents the level of competence, students should possess for a skill or purpose assessed by the OSCE[11].

Absolute standard setting approaches are either examination centered (like the Nedelsky, Eble, Jaeger, Angoff and the modified Angoff methods) or examinee centered (like the contrasting groups and borderline group methods), all of which can be used for standard setting in an OSCE[12].

In the Angoff method, a number of judges review all the checklist items of OSCE stations and decide on the score of the borderline examinees on each item (similar to the contrasting groups method)[12]. The average score of the judges is used as the pass score. In the modified Angoff method, the judges decide on the performance of the borderline examinees at the OSCE station level rather than the item level[12].

The contrasting groups and borderline methods are widely used for deciding the pass score on both small scale and large scale OSCE conducted by medical schools[12]. Setting standards by using the borderline approach is practical and accurate when compared with other absolute methods. This method can contribute to improve the reliability and validity of a high stake exam.[13]

There is no consensus regarding which method should be used for standard setting, deciding on a pass/fail mark, in any examination, including the OSCE. Some studies revealed that Angoff's and borderline methods provide reasonable and defensible approaches to standard setting and are practical to apply by non-psychometricians in medical schools. The borderline method has proved to be cost effective so it can be preferred and this method was found to be more suitable for small scale OSCE[11,14-15].

Reliability and validity of OSCE

The most important aspect of any measurement method is its reliability, validity and feasibility. In many disciplines and specialties OSCEs have been studied extensively and their reliability and validity established[16-18].

Reliability

Reliability refers to the reproducibility of assessment data or scores over time. It is a quality of the outcome or results and not the assessment instrument itself. Reliability estimates the random error of measurement[19]. The number of stations needed depend on how much reliability is acceptable based on the intended use of the assessment results. A higher number of OSCE stations are required to achieve a higher level of reliability. In general, acceptable reliability for high stakes (board certification), moderate stake (end of course, end of year summative assessment), and low stakes (in training, formative assessment) OSCE are more than 0.9, from 0.8 to 0.89, and 0.7 to 0.79, respectively[19]. OSCE has proved to be a reliable method of assessing students knowledge and skills in a particular clinical setup.[20-21]

Validity

Validity refers to the accumulation of evidence that supports meaningful interpretation of the assessment results[22]. Without evidence of validity, OSCE results

can not be interpreted. Validity is a unitary conceptthat requires multiple source of supporting evidence[22]. In general, the higher stake OSCE needs the collection of more validity evidence to support interpretation (board certification). OSCEs have been widely critiqued since their development. In the past 10 years, a number of studies on their measurement properties have been published and different conclusions, based on research were made[23].

A paper by Englander reveled that OSCE is a reliable assessment tool with modest validity if designed appropriately[24].

OSCE has proved to be valid and assessment tool with one argument that who will rate the students[21].

Auewarakul et al found OSCEs to be one of the evaluation methods with the most validity evidence[25]. Similarly Varkey also declared it a powerful valid tool for assessment[26].

Hodges presents the challenges and raises questions as to the definition of validity and its meaning in the OSCE context. He explained that "OSCE is valid only in relationship to the authentic clinical situations in which the subjects have to reproduce 'competent behaviors".[27]

Threats to validity

Threats to validity evidence that can affect the interpretation of the OSCE results are many. The major threat to validity evidence of the OSCE is construct under representation due to under sampling (few OSCE stations) or improper sampling of contents[28]. This can be avoided by carefully developing blueprints that cover all the contents and competency to be assessed and by selecting the OSCE that samples common clinical problems and that covers all such content and competency areas. Involving experts in the blueprint development and sampling process will help to minimize this threat. The other threat to validity evidence is construct irrelevant variance (CIV) due to improper training of standardized patients (SP), flawed SP and checklist, too easy or too difficult cases, bluffing of SP, rater bias (central tendency and halo effect), and indefensible pass criteria[28].

Strategies to improve validity and reliability

- Blueprinting is the process in which representative sample of items that should be included in the assessment is established. It maps the content of the examination against the learning outcome of the course. Always Produce a grid summarizing what is to be tested in the OSCE. It is the process by which the content validity of test is established[29].
- According to Harden and Gleeson[6] (1979) different students should not be assessed on different patients, all students have to examine all the patients.
- In order to achieve greater reliability there must be large number of stations and it should be combined with other methods of assessment.[29]
- The procedure of standard setting requires the input of credible judges in establishing the borderline between those who are considered competent and those who are not.[30]
- Communication OSCE stations can be created with acceptable reliability including difficult cases to evaluate communication skills beyond simple history taking.[31]
- Effective case writing is necessary to run a successful OSCE program. It is important to select cases that highlight the skills and techniques that fulfil the preclinical training philosophy of the institution. Careful structuring of OSCE questions and remediation of OSCE problem stations is crucial to support the continued use of OSCE. Item analysis of OSCE stations should be performed to improve the reliability of OSCE scores.[32]
- The OSCE must be designed in a manner that its objectivity is maximized which can be availed by standardized stations provided with checklist or rating scale.[33]
- There must be adequate training of the examiners and standardized patients. Make sure that examiners are fully briefed prior to the examination about the procedure for the OSCE in general and in particular with regard to the station at which they are examining. The examination should be free of any personal feeling, prejudice or bias to improve reliability.[30,33]
- All the candidates are judged on the similar material to avoid the variability implicit in a situation where candidates encountered different patients as some students come across helpful while the others may face temperamental patients.[33]
- The term *critical action* was defined by Petrusa[34] (2004) for the purpose of introducing a clinical standard of care into long-case skill performance examinations. Regarding OSCE it is defined as an OSCE checklist item whose performance is critical to ensure an optimal patient outcome. For example, in an OSCE designed to assess a student's ability to accurately perform all the elements of blood pressure measurement, a student may perform all the steps correctly but fail to measure the blood pressure accurately. This student will score high if the checklist

does not have the critical action of measuring accurate blood pressure reading. Therefore the critical action is essential in evaluating clinical competence but not required in OSCEs to assess the ability to perform steps of any skill.[23]

- Scoring methods for OSCEs vary widely, and they influence reliability. Checklists have been standard in many OSCE programs but global rating scale showed higher inter-station reliability and construct validity[25,35].

Strength of OSCE

- OSCEs demonstrate particular advantages over traditional forms of testing (such as multiple choice tests, short or long essay questions), in assessing communication and interpersonal skills, professional judgment and moral/ethical reasoning.
- During the last three decades, OSCEs have been used throughout the world with different purposes like for formative and summative assessments, to evaluate curriculum and for feed back to students as well as teachers in undergraduate and postgraduate level.[36]
- The OSCE has proved to be a well established assessment instrument for testing various aspects of clinical practice including skills in practical procedures and investigations.[37]
- Every specialist physicians requires competency in written communication. Written communication skills can also be assessed feasibly and reliably with the help of OSCE.[38]
- In the OSCE, subjective bias is removed as far as possible, like the examiner subjective bias is minimized with the checklist and any bias introduced by candidates can be decreased by encountering the same patients. OSCE is structured so that competencies in physical examination, communication skills, history-taking, counseling, patient education, problem-solving, etc. are tested in a range of areas and not just in one or two areas of medicine.[39]
- The OSCE is not a rigid assessment tool. Examinations vary in the number of stations, the duration of stations and the format of stations.
    - It can be adapted according to the level of examinees, particular discipline or speciality and resources.[39]
- A study observed that the OSCE testing led to significant changes in the learning activities of students and they became more interested in clinical activities.[25]
- The use of OSCEs for evaluation reinforces the patient-centered nature of medical practice and reminds students that they are practitioners but not mere masters of medical knowledge.[25]
- It facilitates assessment of core competence and contemporary professional skills in several medical disciplines in an objective and a transparent manner.[40]
- The use of OSCE reduces the bias in assessment of clinical competence of the candidates[24].
- The main advantage of OSCE is the fact that it allows a sampling of multiple areas of clinical competence compared to the traditional oral clinical examination, overcoming the problem of case specificity and resulting in improved reliability[3-4].
- In OSCE marking is done in a standardized way to increase interrater agreement[3].
- It provides a flexible assessment method through the use of standardized patients[3].
- The OSCE is superior to the oral clinical examination because it overcomes the problem of case specificity by sampling a broad area of competency, resulting in better reliability and validity[4].
- It is good for procedural and communication skills otherwise not routinely tested.
- It assesses competence (shows how) rather than performance (does)[3].
- The wider sampling of competencies and the use of structured marking sheets contribute to improvements in reliability and content validity.
- The entire examination is objective and promotes transparency.
- A large number of students can be evaluated within a short time.
- It encourages increased interaction between the examiner and students[41].

Limitations

- All components of clinical tasks can not be captured by a checklist.

During training, trainee ethics and behavior need to be observed which can't be reliably assessed using OSCE[3].

If there is use of real patients then it causes annoyance, inconvenience, or discomfort to patients.

It is labor-intensive.

All clinical situations can not be simulated by standardized patients[3].

It is time-consuming for the author.

The validity of OSCE suffers with fewer stations[42].

Checklists in OSCEs at times were broader than the task, which can promote bias in marking[42].

- If not planned appropriately, OSCE can become another tool for testing rote recall[42].
- There are lots of chances students collect OSCE stations and questions from their seniors regarding their specialties and make a pool which is continuously transferred to the juniors and in this way students can score high on those stations which are reused.

OSCE and Learning Theories

The educationists emphasize on those instructional methods which promotes active learning which is consistent with adult learning theories. OSCEs seemed to be ideally suited for these learning goals because they provide an opportunity for active participation and learning (building on already acquired skills and knowledge).

Evolution of OSCE in Pakistan

In our country, for many years, medical student evaluation focused on knowledge assessment using written tests comprising of short or long assay questions or/and MCQs as opposed to performance assessment.

Now a day in our country there is paradigm shift in the field of medical education. The medical education has been focused on competency based curricula and examinations. The objective structured clinical examination (OSCE) is the one way of evaluating clinical competency of medical students, residents and postgraduate students.

In Pakistan first time OSCEs have been introduced in the early nineties by the CPSP as an assessment technique for postgraduate examination in the discipline of family medicine[43]. The Aga Khan University (AKU) and King Edward Medical College (KEMC) implemented this technique in the late nineties at undergraduate level. Analysis of OSCE at AKU regarded it as a system of examination that can be used to evaluate affective and psychomotor domains[44]. At KEMC students offered positive and constructive feedback and demanded its implementation in all clinical subjects[45].

The Ziauddin Medical University (ZMU) introduced OSCE in 2004 for the assessment of clinical competencies at the undergraduate level. In a study at ZMU, students appreciated OSCE and offered constructive feedback on structure and organization of the process and also this study regarded OSCE as a practical and useful assessment tool in early years of medical education and found that it identified deficiencies in their clinical skills[46]. The Shifa College of Medicine started OSCE in 2003[42].

It is also being used successfully for undergraduate examinations by the Dow University of Health Sciences, University of Health Sciences Lahore and many other Medical colleges and Universities all over the country.

Implications in our setup

Undergraduate medical education in Pakistan has been based on the traditional model of learning which is teacher centered. The most common teaching modalities are lectures and small-group clinical rotations. Students' knowledge is principally assessed through oral exams and essay-type questions, while their skills are assessed in short and long case formats. The limitations of these assessment approaches include an emphasis on the simple recall of facts and the limited sampling of clinical domains. In addition, the assessment of students' clinical skills with non-standardized patients and settings compromises reliability and validity[42].

The main objective of OSCEs is to evaluate students' skills and approach at a higher level of integrated learning which is not possible with traditional evaluation approaches that rely principally on written or oral examinations.

In the last few years, the Higher Education Commission and Pakistan Medical and Dental Council (PMDC) have carried out an initiative to promote student-centered, small-group and self-directed learning and a patient-oriented style of care to promote better critical reasoning and clinical problem solving among students. This has resulted in several innovations in curricular design, namely well-defined objectives, learner-centeredness, use of small-group learning environments and more reliable and valid assessment tools[42]. Private sector medical colleges and universities like AKU, ZUM, and Shifa College of Medicine, are taking the lead in implementing these innovations.

In Punjab province almost all public and private sector medical colleges are under the umbrella of University of Health Sciences which is playing pivotal role in improving medical education by implementing modern strategies of assessment for medical graduates. It is suggested that in the same way in other provinces single regulatory university should be established for producing uniformity and improvement in the quality of education which in turn will improve the patients care.

The OSCE is a very reliable and valid method of measurement so it should be implemented in the early clinical years like from third and fourth years.

The OSCE can also be used to some extent in the first professional by using manikins, ECG, laboratory investigations, anatomical models, histological slides etc. The overall impact of incorporation of OSCE in early years would have tremendous effects in the performance of students in their clinical years and they will take more interest in studies.

The OSCE is more reliable and valid as compared to written test and MCQ's, therefore, the OSCE needs to be made part of the assessment process for undergraduate and residents in training.

It is suggested that PMDC the regulatory body of medical colleges in the country should recommend its use in early clinical years.

At present the OSCE is being used successfully in our country for postgraduate and final year exams at various places like CPSP, DUHS, AKU, UHS, KEMU, ZMU, SCM. It should be implemented at all medical colleges as an assessment tool for medical graduates in early years of their clinical rotations.

Conclusion

Now a days, it looks that depriving students of valid and reliable assessment tools, like an OSCE, is unethical[42]. There is no single method of assessment which can measure all aspects of clinical evaluation. The OSCE enables the assessment of resident's competence in a more reliable and valid way compared to the traditional clinical examination but a multi method approach to assessment using multi choice questions, OSCE, and performance based assessment is the way to a more accurate assessment.

Performance based testing has become an expectation for the assessment of physician competency. As described by miller[47] (1990), physicians must show or demonstrate their skills, as well as provide evidence of having a sound base of medical knowledge. An OSCE-style examination provides a valid, reliable and feasible means of assessing the range of skills physicians require to practice competently[34].

References

1. Marks M, Humphrey-Murto S. Performance assessment. In: Dent JA, Harden RM, editors. A Practical Guide for Medical Teachers. 3rd ed. London: Churchill Livingstone Elsevier; 2009. p. 333-40
2. Des Marchais JE. OSCE means Scotland in French. Med Teach 2004;24:449
3. Smee S. Skill based assessment. BMJ 2003;326:703-6.
4. Newble D. Techniques for measuring clinical competence: objective structured clinical examinations. Med Educ 2004;38:199-203.
5. Epstein RM, Hundert EM. Defining and assessing professional competence. J Am Asso 2002;287:226-35.
6. Harden RM, Gleeson FA. Assessment of clinical competence using an objective structured clinical examination (OSCE). Med Educ 1979;13:41-54.
7. Harden RM, Stevenson M, Downie WW, Wilson GM. Assessment of clinical competence using Objective Structured Examination. BMJ 1975;1:447-51.
8. Shaw LMA. Effective Assessment of trainees. Obs Gynae 2004;6:171-7.
9. Scalese RJ, Obeso VT, Issenberg SB. Simulation technology for skills training and competency assessment in medical education. J General Intern Med 2007; 23(suppl1):46-9.
10. Hijazi M, Downing SM. Objective structured clinical examinations as an assessment method in residency training: Practical considerations. Ann Saudi Med 2008;28:192-9.
11. Murto SH, MacFadyan JC. Standard setting: a comparison of Case author and modified borderline group methods in a small scale osce. Acad Med 2002;77:729-32.
12. Norcini JJ. Setting standards on educational tests. Med Educ 2003; 37:464-9.
13. Reece A, Chung EMK, Gardiner RM, Williams SE. Competency domains in an objective structured clinical examination: their impact on compensatory standard setting. Med Edu 2008;42:600-6.

Kaufman DM, Mann KV, Muijtjens MMA, Van der Vleuten CPM. A comparison of standard setting procedures for An OSCE in undergraduate medical education. Acad med 2000;75:267-71.

Cusimano MD, Rothman AI. Consistency of Standards and Stability of Pass/Fail Decisions with Examinee-Based Standard-Setting Methods in a Small-Scale Objective Structured Clinical Examination. Acad Med 2004;79(10 suppl):s25-s27.

16. Sloan DA, Donnelly MB, Schwartz RW, Strodel WE. The objective structured clinical examinations: The new gold standard for evaluating postgraduate clinical performance. Ann Surg 1995;222:735-42.

17. Colliver JA, Swartz MH. Assessing clinical performance with standardized patients. JAMA 1997; 278: 790–91.

18. Hodges B., Regehr G, Hanson M et al. An objective structured clinical examination for evaluating psychiatric clinical clerks. Acad Med 1997;72:715–21.

19. Downing SM. Reliability: on the reproducibility of assessment data. Med Edu 2004;38:1006-12.

20. White CB, Ross PT, Haftel HM. Assessing the assessment: Are senior summative OSCE measuring advanced knowledge, skill and attitude?. Acad med 2008;83:1191-95.

21. Murto SH, Sydney S, Touchie C, Wood TJ, Blackmore DE. A comparison of physician examiner and trained assessors in high stake OSCE setting. Acad Med 2005;80(10 suppl):s59-s62.

22. Downing SM. Validity: on meaningful interpretation of assessment data. Med Educ 2003;37:830-7.

23. Payne NJ, Bradley EB, Heald EB, Maughan KL, Michaelsen VE, Wang XQ. Sharpening the eye of OSCE with Critical action analysis. Acad Med 2008;83:900-5.

24. Carraccio C, Englander R. The objective structured clinical examination: A step in the direction of competency based evaluation. Arch Pediatr Adolesc Med 2000;154:736-41.

25. Turner JL, Dankoski ME. Objective Structured Clinical Exams: A critical Review. Fam Med 2008;40:574-8.

26. Varkey P, Natt N, Lesnick T, Downing S, Yudkowsky R. Validity Evidence for an OSCE to Assess Competency in Systems-Based Practice and Practice-Based Learning and Improvement: A Preliminary Investigation. Acad Med 2008;83:775-80.

27. Hodges B. Validity and the OSCE. Med Teach 2003;25:250-4.

28. Downing SM, Haladyna TM. Validity threats: overcoming interference with proposed interpretations of assessment data. Med Educ 2004;38; 327-33.

29. Barman A. Critiques on Objective Structured Clinical Examination. Ann Acad Med 2008;34:478-82.

30. Robert C, Newble D, Jolly B, Reed M, Hampton K. Assuring the quality undergraduate assessments of clinical competence. Med Teach 2006;28:535-43.

31. Hodges B, Turnbull F, Cohen R, Bienenstock A, Norman G. Evaluating clinical skills in objective structured clinical examination format: Reliability and generalizability. Med edu 1996;30:38-43.

32. Auewarakul C, Downing SM, Praditswan R, Jaturatamrong U. Item analysis to improve reliability of an internal medicine undergraduate OSCE. Adv Health Sci edu 2005;10:105-13.

33. Harden RM. Editorial-2: Assessment of clinical competence and the OSCE. Med Teach 1986;8:203-5.

34. Petrusa ER. Taking standardized patient –based examination to the next level. Teach Learn Med 2004;16:98-109.

35. Reghar G, MacRae H, Reznick RK, Szalay D. Comparing the Psychometrics properties of checklists and global rating scale for assessing performance on an OSCE format examination. Acad Med 1998;78:993-7.

36. Patricio M, Juliao M, Fareleira F, Young M, Norman G, Carneiro AV. A comprehensive checklist for reporting the use of OSCE. Med Teach 2009;31:112-24.

37. Patil NG, Saing H, Wong J. Role of OSCE in evaluation of practical skills. Med Teach

2003;25:271-2.

38. Keely E, Myers K, Dojeiji S. Can written communication skills be tested in an objective structured clinical examination format?. Acad Med 2002;77(1):82-6.

39. Harden RM, What is an OSCE?. Med Teach 1988;10:19-22.

40. Agarwal A, Batra B, Sood AK, Ramakantan R, Bhargava SK, Chidambaranathan N, Indrajit IK. Objective structured clinical examination in radiology. Indian J Radiol Imaging 2010;20:83-8.

41. Amiel GE, Tann M, Krausz MM, Bitterman A, Cohen R. Increasing examiner involvement in an objective structured clinical examination by integrating a structured oral examination. Am J Surg 1997;173:546-9.

42. Iqbal M, Khizar B, Zaidi Z. Revising an Objective Structured Clinical Examination in a Resource-limited Pakistani Medical School. Education for Health [Online] 2009;22:1-9. Available from: http://www.educationforhealth.net. [Accessed on 25 September 2010].

43. Zuberi RW, Jafarey NA, Qureshi AF, Elahi F. The Diploma in Family Medicine Examination; a Scientific Exercise. J Pak Med Assoc 1993;43: 217-20.

44. Nizami SQ, Yousuf K, Khan IA, Khan S, Shah U. Evaluation of Objective Structured Clinical Examination(OSCE) for undergraduate students at the Agha Khan University, Karachi. J Coll Physicians Surg Pak 1998; 8: 5-7.

45. Ashraf M. Introduction of OSCE at Undergraduate Level. Ann King Edward Med Coll 2000;6:383-4.

46. Khursheed I, Usman Y, Usman J. Students' feedback of Objectively Structured Clinical Examination: a private medical college experience. J Pak Med Assoc 2007;57:148-9.

47. Miller G. The assessment of clinical skills/ competence/performance.Acad Med 1990;65:563-7.

Beliefs about blood donation among patients visiting OPDs of general hospitals

Naveera Saeed, Ehtesham Munir, Rida Shahid, Rizwan Akbar, Zaheen Baig Sajjad

Abstract

Objective: Not much information is available about blood donation in Pakistan, while a number of misconceptions exist among the populace. This study was, therefore, conducted with the objective of identifying the said misconceptions which could lead to formulation and implementation of better policies regarding blood donation in Pakistan.

Subjects and Methods: Patients visiting OPDs of some of the General Hospitals of Pakistan were the subjects of this study. A total of about 88 subjects (22 from each hospital) were enrolled and were subjected to self-administered questionnaire or face to face interview on the various perceptions of blood donation.

Place of Study: A cross-sectional descriptive study was conducted at four Government General Hospitals of Pakistan ie Holy Family Hospital. Rawalpindi; Pakistan Institute of Medical Sciences, Islamabad; Civil Hospital, Quetta and District Headquarters Hospital, Swabi.

Results: The study results showed that out of about 88 patients, about 40 (45.5 %) were blood donors whereas about 48 (55.5%) were not. About 29 patients knew the correct amount of blood that can be drawn for a single donation. About 12 patients knew the eligible age while about 25 knew about the appropriate body weight for blood donation. The major reason for not donating blood was fear of subsequent weakness.

Conclusion: Our study concluded that there is a need to develop awareness to the public on blood donation, and its importance, so as to get rid of their misconceptions. This will increase the number of blood donors, especially Non-Remunerated Voluntary Blood Donors and help meet the ever-growing demand of blood and its products.

Key words: Beliefs, blood donation, misconceptions.

Introduction

Blood and its products are presently the only transfusion alternatives for the patients of trauma, hemorrhage, tumors, surgical treatments and chronic ailments. With the introduction of modern medical procedures in hospitals, such as bone marrow transplantation, oncology treatment and cardiac surgery, the need for blood and its substitutes are on the rise. Even though there is extensive research in progress into finding alternatives to blood and blood products (red blood cells, platelets, blood clotting factors, fresh frozen plasma and white blood cells), no promising result is likely to be available for years to come.[3]

World over, more than a million blood units are collected annually from blood donors but that is not enough to support the demand and timely availability of blood.

About 25% of the world's population lives in South East Asia but accounts for only 9% of the total blood supply of the world. In Pakistan, there is a need for 3.2 million units of blood against availability of 1.5 million units.[3] Of these 1.5 million units, only 15% comes from VNRBD (Voluntary Non-Remunerated Blood Donors).[3]

✉ **Zaheen Baig Sajjad**

Assistant Professor, Department of Community Medicine, Bahria University Medical & Dental College, Karachi.
Email: dr.zbaig@hotmail.com

Naveera Saeed, Ehtesham Munir, Rida Shahid, Rizwan Akbar
Third year students, Bahria University Medical & Dental College, Karachi.

Received October 02, 2011, Revised November 12, 2011 Accepted December 05, 2011

In Pakistan malnutrition, communicable diseases, road accidents, surgical and obstetrical emergencies and anemia are quite common. Anemia in pregnancy also has a high prevalence (40-60%) with high rates of maternal mortality; 20% mortality in pregnancy anemia is attributed to hemorrhage.[4] There is a profound reluctance of Pakistani population towards donating blood. So a study was conducted to highlight the misinformation, falsity and fears among patients of general hospitals, as their services are within reach of all and sundry.

The various factors attributed to unwillingness towards blood donation and the existing ethnic and racial disparities, as revealed by the Baltimore Study, are: socio-economic status, lack of awareness and the fear of disease transmission.[3] Decision to donate blood has been investigated for decades, to increase efficiency of blood donation. This study can be beneficial for the recruitment of VNRBD, which can potentially lower the blood supply deficit in Pakistan.

Subjects and Methods

A cross-sectional descriptive study was conducted simultaneously at four of the Government Hospitals of Pakistan: Holy Family Hospital, Rawalpindi; Pakistan Institute of Medical Sciences, Islamabad; Civil Hospital, Quetta, and District Headquarters Hospital, Swabi. A total of 88 patients (22 per hospital) were chosen at random, and provided with a self-administered questionnaire. To break the language barrier, an Urdu version of the questionnaire was also made available. One-on-one interviews were conducted to ascertain the patients' knowledge of, and willingness and apprehension/reluctance towards blood donation. All the queries regarding the questionnaire and research were answered beforehand.

Consenting patients between the ages of 18 and 65 years, who never had blood transfusion in their life time, were included in the study. Patients of cancer, chronic illness, or any serious debilitating disease were excluded from the study.The data obtained from the study was analyzed with SPSS version 15.

Table 1Knowledge regarding blood donation

Knowledge regarding blood donation	N = 88 Correct Answers	%
Amount of blood drawn	29	33
Correct age of blood donor	12	13.6
Minimum advisable time period between two donations	32	36.4
Volume replacement	34	38.64
Donation of blood by patient having hepatitis/jaundice	80	90.9
Tattoo and skin piercing	76	86.4
Blood donation with use of Antibiotics during last 7 days	68	77.3
Blood donation by anemic	83	94.3
Donation by pregnant lady/ lady who had a baby during last 9 months/ lactating lady	81	92
Donation by traveler to a malarial region in last 6 months.	76	86.4
Donation by HIV +ve patient	83	94.3
Requirement of blood in emergencies	76	86.4
Blood screening before transfusion	75	85.2
Storage of blood	76	86.4
Use of blood in cancer treatment	49	55.7
One unit of blood transfused to two needy patients	13	14.77
Donation while keeping a fast	43	48.86
Donation during menstruation	23	26.13

Results

Our study revealed the misconceptions, fears and disbeliefs regarding blood donation among the 88 subjects (53 males, 35 females) as depicted in table1.

Blood donors
About 40 subjects (45.5%) were blood donors while about 48 (55.5%) were non-blood donors.

Education level
About 15 subjects (17%) had some sort of primary education while about 10 (11.4%) had no formal education. Other levels of education: About 22 matriculates (25%) and about 37 (42 %) were college graduates.

Knowledge about blood group
About 69 subjects (78.4%) knew their own blood group.

Role of media on blood donation
About 88 subjects gained knowledge about blood donation.

- Electronic media (TV):36 subjects (40.9%)
- Electronic media (Radio):12 subjects (13.6%)
- Print media (dailies, weeklies etc):8 subjects (9.15%)

Willingness among non-donors to donate blood
About 36 subjects, out of the 48 subjects who had never donated blood, did consider donating blood whereas about 86 subjects (97.7%) were willing to donate blood to their family, relatives and friends when needed by them.

Knowledge about importance of blood donation
About 82 subjects (93.2%) knew that donated blood can save someone's life. About 76 subjects (86.4%) were aware that there is a dire need of blood donation in cases of emergencies. 49 subjects (55.7%) were aware that blood and its products are used in treatment of cancer.

Incentive to donate blood among donors
The main incentive for the subjects to donate blood, as shown in Figure 1, was altruism with about 48 subjects (54.5%), followed by money with 15 subjects (17%), to please God with 10 subjects (11.4%) and to obtain extra leave from work with 5 subjects (5.7%).

No incentive to donate blood among non-donors
The main reason for not donating blood (as shown in Fig. 2) came out to be the fear of weakness following blood transfusion with 41 subjects (46.6%), followed by the fear of needles and not being approached by anyone at 12 subjects (13.6%) each. 9 subjects (10.2%) were afraid that they might contract serious

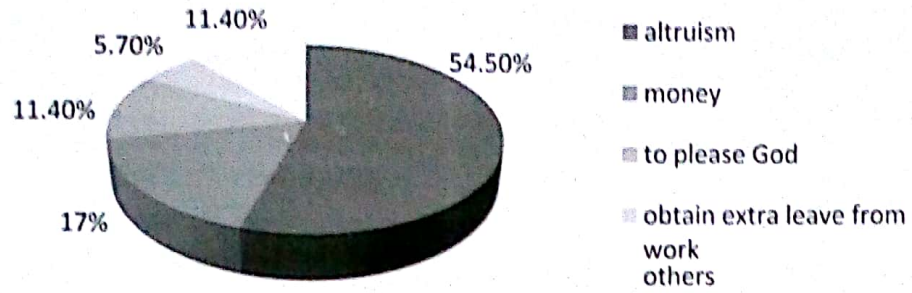


Figure -1 Main reasons for donation by the subjects

...iness during or following blood transfusion. And 7 ...ubjects (8%) thought that they might gain weight ...receding blood donation.

About 8 subjects (9.1%) knew that a person currently on medication (for systemic diseases) cannot donate blood.

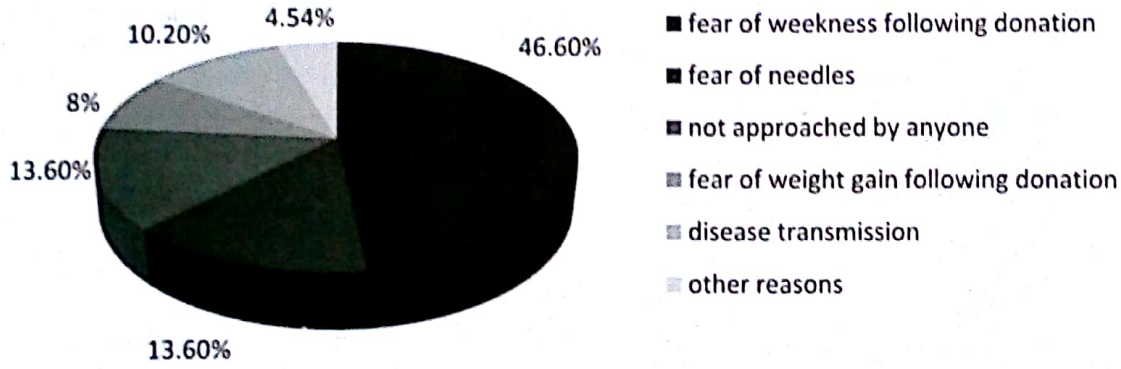


Figure - 2 Reasons for not donating blood

Knowledge about the exact amount of blood drawn for donation

About 29 subjects (33%) were aware about the exact amount of blood drawn for each donation. Analysis of the educational status of patients (as shown in Fig-3) revealed poor knowledge as a whole. Only 28 of the 49 college educated subjects correctly answered the amount of blood drawn to be <500 ml. More specifically looking at different educational levels, about 4 out of 22 matriculates, about 2 out of 15 primary educated subjects and 3 out of 10 illiterate subjects had the knowledge exact amount of blood to qualify as a donor.

About 25 subjects (28.4%) had the correct knowledge of the minimum weight to qualify as a blood donor. About 19 subjects (21.6%) were aware of the inter-donation interval for blood donations. About 12 subjects (13.6%) were aware about the time period for blood volume's replacement whereas unfortunately about 14 subjects (15.9%) were of the opinion that blood once drawn from the body can never be replaced.

Knowledge about eligibility criteria to donate blood

In our study about 12 subjects (13.6%) were aware about the eligible age of donating blood. About 27 subjects (30.7%) knew that a person who have had tooth filling within last 24 hours or had tooth extraction done within last 7 days cannot donate blood either. About 14 subjects (15.9%) were aware that a person who has been in contact with infectious disease or has been given immunization in last 4 weeks cannot donate blood. About 23 subjects (26.1%) correctly knew that blood can be donated by menstruating women.

Knowledge about other conditions for blood donation

Quite unexpectedly, most subjects were aware of the conditions when blood cannot be drawn from the body. About 80 subjects (90.9%) were aware that a person who had hepatitis or jaundice in the last 12 months fails to qualify as a blood donor. About 76 subjects (86.4%) were aware that a person who had tattoos or

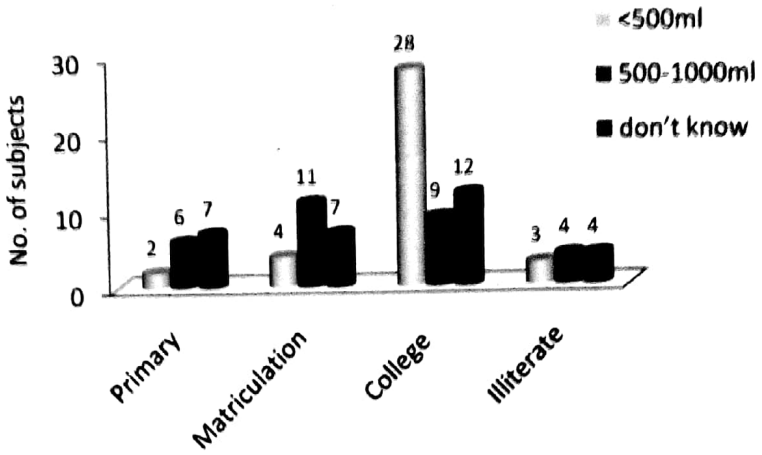


Figure - 3 Educational status of subjects & amount of blood drawn

skin piercing done in the last 6 months cannot donate blood either. About 64 subjects (72.7%) knew that a person who had cough, sore throat or active cold fails to qualify as a blood donor too. About 68 subjects (77.3%) knew that a person who is taking antibiotics, or who has just finished a course in antibiotics in the last 7 days, can not donate blood. About 81 subjects (92%) were aware that a pregnant lady, or who had had a baby in the previous 9 months, or a lactating one, cannot donate blood either. About 76 subjects (86.4%) knew that a person who had travelled to malarial region in the last 6 months cannot donate blood. About 83 subjects (94.3%) were aware that an HIV positive person, or a hepatitis B or C positive person, is not eligible to donate blood. About 79 subjects (89.9%) knew that a person who has ever injected himself with any addiction drugs cannot donate blood either.

Knowledge about blood donation while fasting

About 43 subjects (48.9%) subjects were aware that blood can be donated while keeping a fast and about 46 subjects (52.3%) were aware that donating blood while keeping a fast does not break it.

Knowledge about blood; storage, screening & administering

In respect to usage of the donated blood and its storage, about 75 subjects (85.2%) knew that blood is screened for hepatitis B & C and HIV before it is processed or stored. About 13 subjects (14.8%) were aware that one unit of blood can be transfused as a whole to 2 patients.

Discussion

In a developing country like Pakistan there is a need for having a safe and efficient supply of donated blood. This essential need is ever increasing with factors like increasing population. Therefore, a sound understanding of misconceptions regarding blood donation is required. Our aim was to identify the misinformation and beliefs about blood donation among patients visiting the general hospitals so that an insight can be gained as to why people do not donate blood and, if they do, what are the incentives behind it. This could prove beneficial in increasing the number of VNRBDs. A similar study was conducted among Pakistani Army personnel that also showed lack of blood donation knowledge among the soldiers.[7]

In our study, about 40 (45.5 %) subjects were blood donors. Out of about 48 (54.4 %) subjects who were non-donors, about 36 (40.9 % of the total subjects) had never considered donating blood. Non-donors expressed various reasons for not donating. About 41 non-donors (46.5%) stated that they were 'unfit due to weakness' as a major reason for not donating blood, while rest of the non-donors stated reasons like fears (weakness, needles, disease transmission) and not being approached by anyone etc. for not donating blood.

Mikkelson, Mcvittie et al, Sojka and Lemmens et al also reported fear of blood extraction, risk of disease transmission, lack of time, distrust of the final destination of blood, and a belief that blood donation harms the body as reasons for people not to donate blood.[8] Similarly, a study conducted by Maqbool et al also reported not being approached by anyone and 'unfit due to weakness' as the major reasons for not donating blood[9]. Rajagopalan et al reported that subjects in a medical oriented environment, like nurses and doctors, did not differ much in their fears and misconceptions[10]. A small survey conducted by Gilani et al in Pakistan found that only 3.4% of the doctors and 0% of paramedics were regular VNRBDs.[11] This

shows that along with distribution of proper knowledge, motivation is also required for recruitment of blood donors.

In our study about 22 (25%) subjects were frequent blood donors, while 20 (22.72%) had only donated it once. In a study conducted in the United States, Thomas et al reported that 80% of the first time donors in the world would never return to donate again.[12]

In our study, about 9 subjects (10.22%) did not donate blood due to fear of transmission of diseases and many were soundly aware about the conditions as to when blood cannot be drawn for donation. Aldarees et al conducted a study that reported similar attitude in the Saudi population.[13] In addition, Munoz et al also reported misconception of acquiring AIDS and hepatitis due to blood donation among the French population.[14] Olaiya et al reported in their study, conducted in the Lagos State University Hospital, that 52.4% of the 542 subjects (blood donors) believed they would contract HIV or hepatitis infections from donating blood, even though 98.9% of the subjects were educated (with 36.1% having university degrees).[15]

Dhingra et al reported, in their study conducted in India, that autologous blood donation can be implemented in regions where there is high prevalence/spread of transmissible diseases to increase donated blood store.[16] Therefore, this false perception of blood donation being harmful should be eliminated to increase the number of blood donors.

When subjects were questioned regarding incentives to donate blood, there were many different answers. About 21subjects (23.86%) regarded blood donation as an expression of altruism, while about 11 (12.5%) stated 'pleasing God' as the reason to donate blood. In addition, only about 14 subjects (15.9%) said they will donate for money. The rest cited other incentives e.g. personal, family, extra leave from work etc. Various other incentives should also be explored in future to increase the number of blood donors.

The majority of subjects, about 86 (97.72%) said that they would donate blood if it was required by their relatives and about 82 (93.18%) agreed that they would voluntarily donate blood if a person was in need.

A study to evaluate blood bank practices in Karachi, Pakistan, was conducted, by Stephan Luby et al, which found that out of 24 blood banks, 12 regularly use paid donors and only 6 actively recruit volunteer donors.[17] There is still a strong need for incentives to motivate people in campaigns to donate blood voluntarily in blood banks as one can never tell when the need for blood may arise. A study by Sanchez Am et al in Maryland, USA found blood credit and medical testing to be major motivators for donors to return.[18] This suggests that offering blood credits and medical tests are a safe incentive towards recruiting donors.

Not just whole blood, blood components can also be used effectively in treatment of various conditions and diseases. This study revealed that 39 subjects (44.3%) did not know that their blood can be used for cancer treatment. Likewise, 65 subjects (73.86%) were unaware that blood can be donated by menstruating women. Additionally, only 43 (48.86%) knew that blood can be donated while fasting. It is information like this that, if spread, can greatly amplify the donor pool in countries like Pakistan.

Majority of the participants in this study, 36 (40.9%), acquired their information regarding blood donation from television, while 30 (34.09%) cited other sources like messaging (cellular phones), newspapers and radio. Maqbool et al, through their study, reported blood bank staff and friends as the general source of information providers about blood donation to public.[10] In the same study it was suggested that VNRBDs should be recruited from a low risk group and recruitment policy should be based on the beliefs of a social group being targeted instead of adopting a single global policy for everyone.

Sojka et al, in their study regarding self-reported motives among blood donors, found that 23.5% of the total 531 subjects who were whole blood donors were motivated by 'request via media' to donate blood and in the same study 47.2% of the subjects stated 'influence from a friend' to be the motivating factor.[19] Misje et al, in a similar way, found in their study, influence by active blood donors to be the single most important motivating factor for recruitment of voluntary blood donors.[20] Programs should be initiated to give information to public through every means possible via television, radio, newspapers, internet, SMS alerts, workshops, billboards etc. These steps will eradicate misconceptions regarding blood donation and bring forward more people to donate blood who, in turn, can influence others around them, i.e. friends and family, into adopting a positive attitude towards blood donation. Furthermore, safe and healthy blood donation should be practiced so that the donors feel safe and secure while donating blood.

Conclusion

From our study of patients visiting OPDs of Pakistan's General Hospitals, it has come to our knowledge that the awareness among the public regarding blood donation is lacking. Lack of knowledge regarding their own blood group had a negative impact altogether. Electronic media is the leading source of provision of information regarding blood donation and can be used as a tool to create awareness among the population. In present times internet can be used to promote voluntary blood donation among the population.

Recommendations

- Radio and television, particularly through their transmissions in regional languages, may be used as an effective means to spread awareness about blood donations.
- Print media e.g. newspapers may be approached to create awareness among the literate population of Pakistan.
- People who are somewhat aware about blood donation but have misconceptions should be educated by various means, like incorporating educational institutes

Acknowledgement

The researchers are thankful to Prof.Dr.Farida Habib,Head,Dept. of Community Health Sciences, Bahria University Medical & Dental College for her guidance and supervision in carrying out this piece of research.

References

1. Maqbool Alam, Mohammad Talha, Shafiq Ahmed. Perceptions About Blood Donation Among Army Personnel. PAFMJ 2006; 3:311-5.

2. Lowe KC, Ferguson E. Benefit and risk perceptions in transfusion medicine: Blood and blood substitutes. J Intern Med 2003; 253:498-507.

3. Damesyn MA, Glynn SA, Schreiber GB, *et al.* Behavioural and infectious disease risks in young blood donors: implications for recruitment. Transfusion 2003;43:1596-603.

4. Kazi BM, Salman M A. Review of HIV/AIDS Situation and national AIDS program of Pakistan. Pak J Med Res 1998; 37:13-7.

5. Global Consultation, 100% Voluntary Non–Remunerated Donation of Blood and Blood Components Melbourne, Australia 2009;9-11.

6. Boulware LE, Ratner LE, Ness PM, et al. The contribution of socio-demographic, medical, and attitudinal factors to blood donation among the general public. Transfusion 2002;42:669-78.

7. Mikkelsen N. Who are the donors in 2003? Transfusion Clinique et Biologique 2004; 11:47-52.

8. McVittie C, Harris L, Tiliopoulos N "I intend to donate but..." non donors' views of blood donation in the UK. Psychology, Health & Medicine 2006; 11:1-6.

9. Masalmeh Bel D. Knowledge, Attitudes And Practices Regarding Blood Donation Among The Saudi Population. Saudi Med J 2004; 25(3):318-21.

10. Rajagopalan M, Pulimood R. Attitudes of medical and nursing students towards blood donation. Natl Med J India 1998;11:12-3.

11. Gilani I, Kayani ZA, Muhammad A. Knowledge, Attitude And Practices Regarding Blood Donation Prevalent In Medical And Paramedical Personnel. JCPSP 2007;17:473-6.

12. Thomson RA, Bethel J, Lo AY. Retention of "safe" blood donor. The Retrovirus Epidemiology Donor Study. Transfusion 1998;38:359-67.

13. Aldarees AM . Attitude, belief and knowledge about blood donation and transfusion in Saudi population. Pak J Med Sciences 2008;24:74-9

14. Munoz Sastre MT, Bacq Y, Mullet E, et al. Misconceptions Regarding Hepatitis C In The French Public. Prev Med 2002;34:596-9.

15. Olaiya MA, Alkija W, Ajala A, et al. Knowledge, attitudes, beliefs and motivation towards blood donation among blood donors in Lagos, Nigeria. Transfusion Med 2004;14:13-7.

16. Dhingra-Kumar N, Sikka M, Madan N, et al. Evaluation of Awareness and Utilization of an Autologous Blood Transfusion Programme. Transfusion Med 2001;11:177-82.

17. Evaluation of Blood Bank Practices in Karachi, Pakistan and The Government's Response, Oxford Journals, Medicine, Health Policy and Planning 15; 2:217-22.

18. Sanchez AM, Ameti DI, George B, The Potential Impact of Incentives on Future Blood Donor Behavior & Transfusion. 2001;41:172-8.

19. Sojka BN, Sojka P. The Blood Donation Experience; Self-Reported Motives and Obstacles or Donating Blood. Vox sang 2008:94;56-63.

20. Misje AH, Bosnes V, Gasdal O, et al. Motivation, Recruitment and Retention of Voluntary Non-Remunerated Blood Donors; A Survey Based Questionnaire Study. Vox sang. 2005;89;236-44.

CASE REPORT

A rare case of Gyrate atrophy

Muhammad Waseem, Saquib Naeem, M Saleem Bajwa

Abstract

Gyrate atrophy is rarely seen in ophthalmological practice. We diagnosed one such case in our set-up. A middle aged male presented with decreased vision. Fundus showed patches of well-demarcated, scalloped atrophy of the pigment epithelium and choriocapillaris. Fundus fluorescein angiography revealed sharp contrast between normal and abnormal tissue which was typical characteristic of changes of Gyrate atrophy. Treatment includes pyridoxine (vitamin B6) and special diet. Prognosis usually remains poor and is a cause of disability. This case was being reported for general awareness.

Introduction

Gyrate atrophy is a rare entity. It is autosomal recessive bilateral disorder due to deficiency of enzyme Ornithine aminotransferase. Clinical features usually start in second decade. Symptoms include decreased midperipheral visual field leading to night vision problems, though central visual acuity is spared till late in the disease course. Fundus shows the gradual development of patches of well-demarcated, scalloped atrophy of the pigment epithelium and choriocapillaris in the midperiphery with characteristic border of surrounding hyperpigmentation, which eventually coalesce together till macula is involved resulting in decreased vision in later life. Fundus fluorescein angiography shows hyperfluorescence on the border of atrophic patch and sharp contrast between normal and abnormal tissue. Other ocular changes include mild cataractous opacities and mild maculopathy in later stages of the disease. Systemic features are mild which may include decreased intellect, myopathy and hair changes. Treatment includes pyridoxine (vitamin B_6) and special Arginine-free diet which may reduce the severity of the disease. Prognosis usually remains poor in later life[1-3].

Case report

A 50-year-old male presented in eye department PNS Shifa Karachi with complaint of decreased vision in right eye of 8 months duration. There was a history of a trauma to this eyeball of the same period. There was no other co-morbidity including night blindness.

✉ **Muhammad Waseem**

Prof and Head of Ophthalmology Department BUMDC & PNS Shifa Hospital, Karachi, Pakistan.
E-mail: muhammadwaseem57@gmail.com

Saquib Naeem
BUMDC & PNS Shifa Hospital, Karachi, Pakistan.

M Saleem Bajwa
BUMDC & PNS Shifa Hospital, Karachi, Pakistan.

Received October 17, 2011, Accepted November 09, 2011

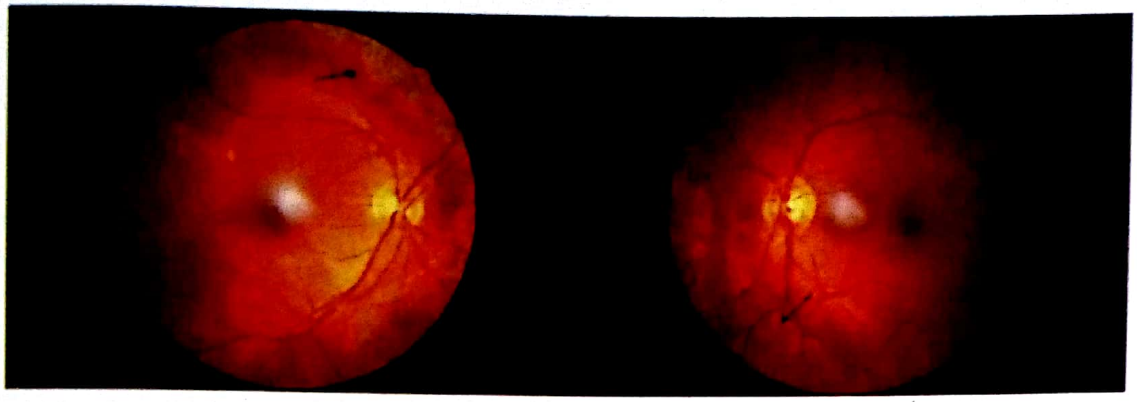
Vision in right eye was 6/9, correctable to 6/6 with glasses and the left eye was 6/6 unaided. Anterior segments were normal in both eyes. Pupils were reactive to light. Ocular motility was normal in all directions of gaze on both sides. The fundi oculi showed patches of well-demarcated, scalloped atrophy of the pigment epithelium and choriocapillaris with characteristic border of surrounding hyperpigmentation in mid-periphery. Optic disc and the macula were normal (Fig.1). Intraocular pressure was normal on both eyes. Systemic examination was normal.

On investigation, Fundus fluorescein angiography showed hyperfluorescence on the border of atrophic patch and a sharp contrast between normal and abnormal tissue (Fig.2) Patient was recommended tablet Pyredoxin 300 mg and to take Arginine- free diet. He was referred for visual fields, EOG and ERG and to the laboratory for enzyme assay.

Discussion

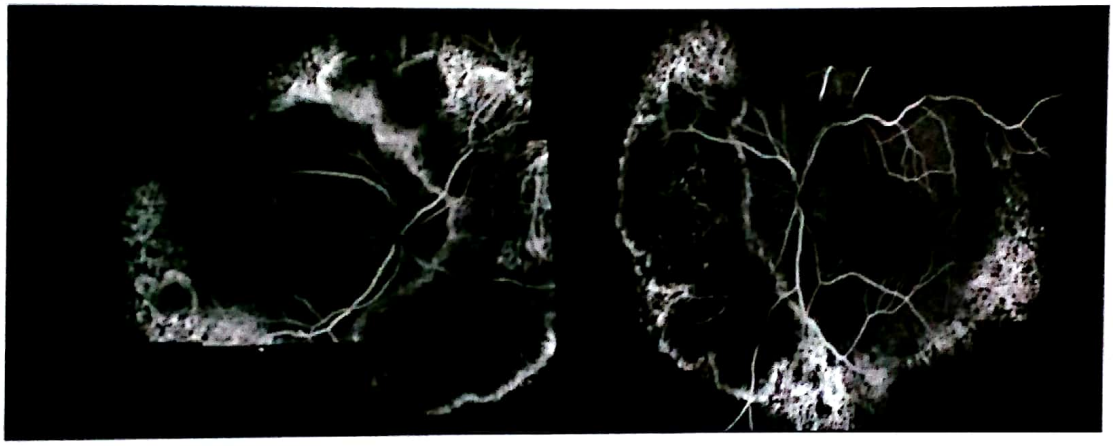
Gyrate atrophy, also known as essential atrophy of the choroid, occurs in early adult life is a rare condition[4]. So far, more than 150 cases have been identified[5]; approximately one third is from Finland). Ours will be 151th. Patient usually complains of defective night vision initially but somehow, this was not the presenting complaint in this case. He attributed his defective vision to the trauma to his right. The characteristic fundus findings and fluorecein angiographic pictures so typical of Gyrate atrophy were all present in our patient. Systemic involvement can occur but there was no such evidence in our patient. The treatment of choice is vitamin B6 and low Arginine diet but it is yet to be shown that modification of the metabolic control has any influence on the eye disease[6-7] .We have started the treatment but so far we have not got the feedback and so the response could not be judged.

If started at an early age, long-term substantial reduction of plasma ornithine levels may appreciably slow the progression of the chorioretinal lesions[8]. We would like to follow this case at six months interval.



Right Eye Left Eye

Figure-1Fundus photograph of the patient



Right Eye Left Eye

Figure-2 Fundus Fluorescein Angiographs of the patient

Conclusion

Gyrate atrophy of the choroid and retina is a rare inborn metabolic disorder whose ocular effects may occur at any time during the course of the disease. It should be suspected in any patient who presents with subtle ocular symptoms in presence of chorioretinal atrophic patches in mid-periphery and can be confirmed on fundus fluorescein angiography and plasma Ornithine levels. Result of the treatment is fruitful if detected and treated early in life.

References

1. Juan Jr E, Noorily SW, Townsend-Pico WP, Chern KC. Hereditary Disorders in Childer and Young Adults. Ch 57.In: Wright K W, ed. Textbook of Ophthalmology, Williams & Wilkins 1997; 812-3.

2. Kanski JJ. Clinical Ophthalmology: A systematic approach, 4th ed. oxford: Boston; 1999.

3. Epstein RL. Hyperornithinemia: Gyrate Atrophy of the Choroid and retina. Inborn Metabolic Disorders and the Eye.Ch 28 In: Peymann GA, Sanders DR, Goldberg MF. eds. Pricipal and Practice of Ophthalmology. Vol 3, WB Saunders Company 1980;1759-60.

4. Miller SJH. Diseases of the Uveal Tract.Ch 18. Parsons' Diseases of the Eye. 17th ed. Churchill Livingstone 1984; 167.

5. Gyrate atrophy of the choroid and retina. Available at: http://ghr.nlm.nih.gov/condition/gyrate-atrophy-of-the-choroid-and-retina, 2009.

6. Newell FW. Gyrate Atrophy of the Choroid. The Middle Coat:The Uvea Ch 15. In: Ophthalmology Prinicipal and Concepts. 6th ed. The C.V. Mosby Company 1986; 287.

7. Bird AC. Retinal Receptor Dystrophies.In:Miller SS. Clinical Ophthalmology, Wright 1987; 208-9.

8. Kaiser-Kupfer MI, Caruso RC, Valle D. Gyrate atrophy of the choroid and retina: further experience with long-term reduction of ornithine levels in children. Arch Ophthalmol. 2002;120:146-53.

Instructions for authors

Aims and objectives

The JBUMDC is a biannual journal and publishes original scientific articles, reviews and case studies in clinical and basic sciences. The journal would encourage and support meaningful basic and clinical research, and facilitates and promotes excellence in medical sciences.

It accepts manuscripts prepared in accordance with the "Uniform Requirements for Submission of Manuscripts for Biomedical Journals, updated October 2008", adopted by International Committee of Medical Journal Editors (ICMJE), online available at URL: www.icmje.org.

Submission items include a cover letter, the manuscript (including the running title, title page, structured abstract, manuscript text, references, tables, and figures. The cover letter should identify the person (with the address, telephone number, fax numbers, and e-mail) responsible for correspondence concerning the manuscript.

All correspondence regarding submitted manuscripts will be handled via e-mail. Send all other correspondence to: Editor, JBUMDC, Bahria University Medical & Dental College, 13-National Stadium Road, Karachi.

Email. editor.bumdc@bahria.edu.pk

Preparation of manuscripts

Original Articles should be no longer than 3500 words and include no more than six figures and tables and 40 references.

Clinical Reviews and other Reviews should address topics of importance to clinical and basic sciences. These manuscripts should be no longer than 4000 words and include no more than four figures and tables and 80 references. Authors should include a brief section describing the search strategies used to obtain information for the review.

Clinical Case Reports must be of academic and educational value and provide relevance of the disease being reported as unusual. Brief or negative findings may appear in this section. It should have a non structured abstract of about 100 words with maximum of 8 references.

Manuscripts must be typed double-spaced with margins of at least 25 mm (1 in). Each of the following manuscript components should begin on a new page in the following sequence: Page 1, Running Title, a maximum of 40 spaces and letters; Page 2, Title Page, provide the full title, full name(s) of author(s), highest awarded academic degree, institutional affiliation(s), address(es), and acknowledgement of financial support (grant number, institution, and location) if any; Page 3, Structured Abstract and Key Words. The abstract should present the study objective, design, setting, patients, interventions, main outcome measure (s), results, and conclusions. Emphasize new and important aspects of the study or observation. Abstract should not exceed 200 words. Below the abstract provide 3 to 5 key words or short phrases that will assist indexers in cross-indexing the article. The following components should be identified after the abstract: Introduction, Materials and Methods, Results, Discussion, Acknowledgments, References, Tables, and Legends.

Introduction

The article should begin with a brief introductory statement that places the work to follow in historical perspective and explains its objective and significance.

Materials and Methods

These should be described and referenced in sufficient detail for other investigators to repeat the work. The source of kits, chemicals and reagents, and special pieces of apparatus should be stated. For modified methods, only the modifications need be described.

Results and Discussion

The Results section should briefly present the experimental data in text, tables, and/or figures.

The Discussion should focus on the interpretation and significance of the findings with concise objective comments that describe their relation to other work in that area. The discussion should not reiterate the results.

Acknowledgments

The Acknowledgments section should include the names of those people who contributed to a study but did not meet the requirements for authorship.

All persons designated as authors should qualify for authorship. Each author should have participated sufficiently in the work to take public responsibility for the content. In general, no more than six authors are considered appropriate.

Units of Measurement.

Measurements of length, height, weight, and volume should be reported in metric units (meter, kilogram, or liter) or their decimal multiples. Temperatures should be given in degrees Celsius. All hematologic and clinical-chemistry measurements should be reported in the metric system in conventional units.

References

The references should in the Vancovour style of refrencing. Number references consecutively in the

order in which they are first mentioned in the text. References are identified by Arabic numerals in parentheses.

The titles of journals should be abbreviated according to the style used in Index Medicus. List only three authors in an article, but if the number exceeds three, then give three names followed by et al.

Examples of references:

Journal articles

1. Lateef M, Baig M, Azhar A. Estimation of serum osteocalcin and telopeptide-C in postmenopausal osteoporotic females. Osteoporos Int 2010; 21:751-5.
2. Isidori AM, Storollo F, More M, et al. Leptin and aging: correlation with endocrine changes in Male and Female healthy adult populations of different body weights. J Clin Endocrinol Metab 2000;85:1954-62.

Books

1. Colson JH, Armour WJ. Sports injuries and their treatment. 2nd rev. ed. London: S. Paul; 1986.
2. Gilstrap LC , Cunningham FG, VanDorsten JP, editors. Operative obstetrics. 2nd ed. New York: McGraw-Hill; 2002.

JBUMDC Reviewers of 2011

The editor and members of editorial board of JBUMDC extend their gratitude to the following colleagues who reviewed articles submitted for publication from January – December 2011.

Arif Siddiqui
Murad Qadir
Nighat Huda
Rafique Gooda
Shaheen Moen
Shamaun Razi
Tabassum Naveed
Tehseen Haider Kazmi
Zehra Naqvi

Bahria University Medical and Dental College, Karachi

Published By: Bahria University Medical and Dental College
13-National Stadium Road, Karachi-75260, Pakistan
Tel: +92 21 99240006-11
Fax: +92-21 348503088
Website: http://www.bumdc.bahria.edu.pk/jbumdc

Design & Printed By:
Version 02 E-mail: sirkashif1@hotmail.com