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Recognition of Faculty Imparting Teaching in Medical Education

Syed Muhammad Tariq Rafi

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It is indeed a matter of great honor and pride for me to write the editorial for the first publication of the Annals of Jinnah Sindh Medical University, Karachi. The topic I have chosen to write upon is in my view very pertinent to the current scenario of education in Pakistan.

The administration of an institution needs to understand the importance of teaching in these institutes and for that purpose should encourage the teachers by rewarding them for their endeavors. This will increase the influx of educators in teaching institutes especially for medical education. Researchers and psychologists indicated that motivation for teaching and behavior changes depends upon rewards, reduction of discomfort, and personal development¹. Dundar and Lewis² showed that increasing the faculty members for postgraduate programs enhanced the research productions. Furthermore, encouraging the faculty to seek more grants from funding agencies, and improve university research resources, such as literature searching resources, technology, and graduate students also increases the research productivity². The Government Policies in developing world though have very meager investment in research but this investment is more tilted towards clinical services rather than enhancing research in Basic and Clinical subjects or investing in equipments and gadgets to modernize the services.

This attitude of our Universities especially Medical Universities has failed to attract bright and intelligent youngsters to research and teaching and has resulted in what we see today a great dearth of teaching faculty especially in basic medical sciences. The institutions are focused on improving the delivery of health care facilities to masses but with this focus we have become myopic and failed to realize that all these objectives cannot be achieved without investing into Human Resource and research which will be the main source of supply to deliver to our patients, the system that we are following today is unable to meet the aspiration of our masses and has failed to deliver as what we see today.

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In our country the medical institutions are competing to outreach patients and emphasis is on their clinical aspects, this has resulted in deterioration of the standard of medical education and research, the faculty has realized this shift, resulting in the loss of interest in research both basic and medical educations. This has badly affected the teaching training and clinical services.

To improve this scenario to be at par with the developed countries and to improve our standards, and pull back our faculty towards research and medical education we need to have a paradigm shift with a tilt towards our basic objectives, this can be achieved by awarding our faculty members for their research and good teaching endeavours. Chen et al also reported that both the extrinsic and intrinsic rewards play the major roles in enhancing research output. Untenured faculty members produce more with extrinsic rewards, while tenured faculty members publish more with intrinsic rewards³. This will promote enthusiasm and dedication among the faculty members towards continuing professional development. Our teachers need to be given respect and compensated monetarily and those who pursuit research as a carrier should not feel at a disadvantage, the teaching should regain its status as a very respectful profession with teachers given more acknowledgement than the administrators. The government and institutions should pour in more funds in research and professional development and reward the researchers and teachers who excel in their fields and regain the glory of our medical education.

These measures I am positive will shift the tilt towards research and medical education. This is a need of the hour and as a person sitting with decision making authority in a University I feel it's my responsibility to work on these, this may be a drop in the ocean but there is always a first step.

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Profile of Dental Research in Pakistani Dental Journals during Last Ten Years (2003-2012)

Nazeer Khan^{*1}, Arshad Hasan², Syed Arif Ali³, Mehwish Hussain³ and Sundus Iftikhar⁴

ABSTRACT

Objectives: The objectives of the present study were to create a profile of dental research by Pakistani authors in the two national dental journals; and to determine the changes occurred over a ten years period from 2003 to 2012.

Methodology: All the issues of the two dental journals in Pakistan; Journal of Pakistan Dental Association (JPDA) and Pakistan Oral and Dental Journal (PODJ) from 2003 to 2012 were manually reviewed. Only those articles which had first author from Pakistan were included in the study. All the selected articles were categorized by article type, and type of basic and clinical research. Chi-square test was utilized to compare the information collected from the two journals.

Results: Five hundred and eighty one articles were published during the study period of 2003 to 2012 in JPDA and PODJ. Two hundred and forty three articles were published in JPDA and 338 in PODJ during the study period the total number of articles published in the JPDA and PODJ became double from 46 to 100...About three-fourth (73.7%) articles were categorized as "original article". A significantly higher percentage of original articles were published in PODJ as compared to JPDA. Articles on health system policy, clinical trials and dental material were rarely (less than 5%) in both journals..Two-third (64%) of the printed articles could be categorized as 'Clinical Research'. PODJ published more clinical research articles as compared to JPDA..Among clinical research articles; maximum percentage (34.4%) was in specialty of Orthodontics.

Conclusions: The number of articles published in JPDA and PODJ doubled during the study period from 2003 to 2012. However, the increase lacks in areas such as randomized clinical trials, dental material and population-based studies.

Key words: Bibliometric analyses, dental journals, publications, Pakistan.

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خلاصہ

مقصد: اس تحقیق کا مقصد ان طب دندان تحقیقات کے بارے میں مواد کو پیش کرنا ہے جس کے محقق پاکستانی ہوں اور وہ پچھلے دس سال (۲۰۰۳ء سے ۲۰۱۲ء) کے عرصے میں پاکستانی قومی طب دندان جرائد میں شائع ہوئے ہوں۔ اس کے علاوہ اس دورانیہ میں اس تحقیقاتی مقالوں میں کیا تبدیلی آئی ہے کا مطالعہ بھی پیش کیا جائے گا۔

طریقہ کار: ان سارے مقالوں کو پاکستان کے دونوں طب دندان جرائد (Journal Of Pakistan Dental Association (JPDA) and Pakistan Oral and Dental Journal (PODJ)) and میں پچھلے دس سالوں (۲۰۰۳ء سے ۲۰۱۲ء) کے دورانیہ میں شائع ہونے والے مقالوں کو اس تحقیق میں شامل کیا گیا جس کے پہلے مصنف کوئی پاکستانی تھا۔ ان سارے مقالوں کو مقالوں کے قسم اور بنیادی اور تشخیصی تحقیقات (Basic and Clinical Research) میں تقسیم کیا گیا۔ Chi-Square ثنائی شمارائی ٹسٹ کو جمع کئے گئے مواد کو موازنے کے لئے استعمال کیا گیا۔

تحقیق کے نتائج: پچھلے دس سال (۲۰۰۳ء سے ۲۰۱۲ء) میں JPDA اور PODJ میں کل پانچ سو آٹھ (۵۰۸) مقالہ تصنیف ہوئے۔ JPDA میں دو سو تینتالیس (۲۴۳) اور PODJ میں تین سو اڑتیس (۳۳۸) مقالے شائع ہوئے ہیں ان دس سالوں میں ان دونوں جرائد میں شائع ہونے والے مقالوں کی تعداد دوگنی (۶۴ سے ۱۰۰) ہو گئی۔ ان شائع شدہ مقالوں میں تین چوتھائی (۷۳.۷%) اصل مقالے (ORIGINAL ARTICLES) تھے۔ JPDA کے مقابلہ میں PODJ میں نمایاں فرق سے زیادہ اصل مقالے شائع ہوئے۔ ان دونوں جرائد میں

Dental Material, Clinical Trial اور Health System Policy کے بہت ہی کم (۵% سے بھی کم) مقالے شائع ہوئے۔ دو تہائی (۶۴%) مقالوں کو Clinical Research کہا جاسکتا ہے۔ Clinical Research کے تحت شائع شدہ مواد میں شعبہ Orthodontics میں زیادہ مقالہ (۳۴.۴%) شائع ہوئے۔

حاصل مطالعہ: تحقیقی دورانیہ میں پچھلے دس سالوں (۲۰۰۳ء سے ۲۰۱۲ء) کے درمیان ان دونوں جرائد JPDA اور PODJ کے شائع شدہ مقالے دگنے ہو گئے لیکن دندان سازی کے اجزاء بے ترتیب تشخیصی مرحلوں اور آبادی میں تحقیقات بہت کم ہوئیں۔

INTRODUCTION

Bibliometric analyses summarize and review scientific publications using different statistical techniques^{1,2}. Biomedical research outputs of different countries have been discussed in the literature^{1,3-6}. Some bibliometric analyses are conducted for specific section of articles, like use of statistical methods and analysis⁷⁻¹³. Bibliometric analyses have also been conducted for alternative medicine, like homeopathy¹⁴. Bibliometric

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analyses are routinely conducted for journals related to oral health sciences¹⁵⁻²¹. However, very few bibliometric studies have been conducted on Pakistani medical journals²²⁻²⁴. As far as authors' knowledge is concern, no attempt has been made for bibliometric analysis on dental journals published from Pakistan. There are about 65 biomedical journals published in Pakistan. Nevertheless, only three of them are indexed in MEDLINE (PUBMED) of US Library of Medicine. Only three journals are included for impact factor in ISI (Institute for Scientific Information) list, currently known as Thomson Scientific. Out of 65 biomedical journals, only two explicitly publish oral health related articles. Both the journals are neither in MEDLINE nor in ISI list that significantly reduces their international exposure. This highlights the importance of assessing the work of Pakistani oral health researchers. Hence, a survey was conducted on these two dental journals for bibliometric analyses. The objectives of the present study were to create a profile of dental research by Pakistani authors in the two national dental journals; and to determine the changes occurred over a ten years period from 2003 to 2012.

METHODOLOGY

Two dental journals are regularly published from Pakistan: one from Karachi, titled, 'Journal of Pakistan Dental Association (JPDA)' and one from Islamabad titled 'Pakistan Oral and Dental Journal (PODJ)'. PODJ is the oldest dental journal of Pakistan, being published since 1981. JPDA started its publications in 1986 as JAPDAK (Journal of Pakistan Dental Association, Karachi) and later its name was changed to "Journal of Pakistan Dental Association (JPDA)". All the issues of JPDA and PODJ from 2003 to 2012 were manually reviewed. Websites of JPDA and PODJ were used to download the articles, and if the issue was not available on the website, then the library were utilized for collection of the article. Only those articles which have 1st author from Pakistan were considered for the study. Book reviews, letters to the editors, conference announcements and organizational-based communications were excluded from the study. JPDA used to publish four issues per year and PODJ three issues per year during the study period. All the selected articles were categorized as follows:

Type of article: (case report, editorial, original article, review article, and short communication)

Type of research (behavioral/environmental/social, clinical epidemiology, clinical trials, dental material research, epidemiology, health system/policy, laboratory studies/clinical investigations, patient series/management, and radiology)

Type of basic research (community dentistry, dental education, dental material, ethics & medico-legal

issues, oral anatomy, oral medicine, oral pathology, and pre-clinical dentistry)

Type of clinical research (dental radiology, endodontics, fixed prosthodontics, operative dentistry, pedodontics, oral & maxillofacial surgery, oral implantology, periodontics, oral surgery, orthodontics, removable prosthodontics).

The classification was carried out by one of the co-authors (AH), who is a dental academician and is attached in one of the dental journals as Assistant Editor. Since the study had a retrospective design and published data were used for the study, it was exempted from ethical approval. The information was entered into a computer using EXCEL and converted into SPSS for computation. Chi-square test was utilized to compare the information obtained from the two journals. P-value of 5% was used for significant level.

RESULTS

Table 1 shows the descriptive statistics and comparison between JPDA and PODJ in terms of number of articles per study year, type of articles and type of research. Five hundred eighty one articles were published during the study period of 2003 to 2012 in JPDA and PODJ. Two hundred forty three articles were published in JPDA and 338 in PODJ. During the study period the total number of articles published in the JPDA and PODJ became double from 46 to 100. The increase in number of publications was higher in PODJ than JPDA, however, the difference was not statistically significant ($p=0.431$). About three-fourth (73.7%) of the articles were categorized as "original article" followed by 'case reports' (13.4%). PODJ published significantly higher percentage of original articles and less percentage of case reports as compared to JPDA (81.1% vs 63.4%; 10.1% vs 18.1% respectively). These differences were highly significant ($p<0.0001$). About one-third of the articles (30.7%) belonged to clinical epidemiology followed by the 'patients' series' (23.5%). While comparing the two journals with respect to type of research published, it was shown that PODJ published more articles for Radiology as compared to JPDA (15.4% vs 8.3%), while it published less articles in dental materials (3.8% vs 6.2%). However, these differences were of marginal significance only ($p=0.055$). Articles on health system policy, clinical trials and dental material were less than 5% in each journal.

Table 2 contains basic statistics regarding type of research (basic/clinical) and specialty published in the two journals. Approximately, two-third (64%) of the articles could be categorized as 'Clinical Research'. PODJ published more for clinical research as compared to JPDA (67.8% vs 58.7%) and the difference was statistically significant ($p=0.025$). Among 'basic

Table 1: Frequency of publications by the year, type of articles and type of research as categorized by the journals

		JPDA	PODJ	Total
Year of Publications	2003	21	25	46
	2004	21	28	49
	2005	15	23	38
	2006	18	27	45
	2007	12	28	40
	2008	18	36	54
	2009	27	45	72
	2010	33	34	67
	2011	36	34	70
	2012	42	58	100
	Total	243	338	581
	p-value	0.431		
Type of Articles	Original Articles	154 (63.4)	274 (81.1)	428 (73.7)
	Case Reports	44 (18.1)	34 (10.1)	78 (13.4)
	Review Articles	25 (10.3)	15 (4.4)	40 (6.9)
	Editorial /Opinions	20 (8.2)	15 (4.4)	35 (6.0)
	p-value	<0.0001		
Type of Research	Epidemiology	13 (5.4)	25 (7.4)	38(6.6)
	Clinical Epidemiology	73 (30.3)	105 (31.1)	178 (30.7)
	Material Research	15 (6.2)	13 (3.8)	28 (4.8)
	Radiology	20 (8.3)	52 (15.4)	72 (12.4)
	Clinical Trials	14 (5.8)	18 (5.3)	32 (5.5)
	Lab Studies	31 (12.9)	26 (7.7)	57 (9.8)
	Patient Series	62 (25.7)	74 (21.9)	136 (23.5)
	Behavioral Research	8 (3.3)	20 (5.9)	28 (4.8)
	Health System Policy	5 (2.1)	5 (1.5)	10 (1.8)
	p-value	0.055		

research’ articles; both ‘oral pathology’ and ‘community dentistry’ were one-third each, while “dental materials” was the least (5.7%) published category. There was no significant difference (p=0.375) between the two journals in terms of basic sciences specialty of the publications.. Among ‘clinical research’ articles; majority (34.4%) was that of orthodontics papers while the least (3.6%) were on operative dentistry. PODJ published more articles in orthodontics as compared to JPDA (44.9% vs 17.3%), while JPDA published greater number of papers in endodontics as compared to PODJ (19.4% vs 9.3%). The difference in clinical specialty category among the two journals was highly significant (p<0.0001).

DISCUSSION

This bibliometric analysis was the first of its kind for Pakistani oral dental journals. Though a significant amount of research work is being conducted by Pakistani oral health scientists, yet they are not being read and cited in international dental literature¹⁹. The above claim may be justified by the fact that about one hundred articles were being published per year latest by 2012. However, only 37 articles were published by Pakistani oral health scientists in ISI and Pubmed journals¹⁹.

Table 2: Frequency of type of research (basic and clinical) and specialties categorized by the journals

		JPDA	PODJ	Total	
Type of Research	Basic	100 (41.3)	109 (32.2)	209 (36.0)	
	Clinical	142 (58.7)	229 (67.8)	371 (64.0)	
	p-value	0.025			
Basic Research Areas	Dental Material	7 (7.0)	5 (4.6)	12 (5.7)	
	Oral Pathology	41 (41.0)	36 (33.0)	77 (36.8)	
	Oral Medicine	10 (10.0)	15 (13.8)	25 (12.0)	
	Community Dentistry	28 (28.0)	41 (37.6)	69 (33.0)	
	Ethics & medico-legal	6 (6.0)	8 (7.3)	14 (6.7)	
	Oral Anatomy, Dental Education, Pre-clinical	8 (8.0)	4 (3.7)	12 (5.7)	
	p-value	0.375			
	Clinical Research Areas	Periodontics	13 (9.4)	11 (4.8)	24 (6.6)
		Oral & Maxillofacial Surgery	26 (18.7)	56 (24.7)	82 (22.4)
		Endodontics	27 (19.4)	21 (9.3)	48 (13.1)
Operative Dentistry		8 (5.8)	5 (2.2)	13 (3.6)	
Fixed Prosthodontics		13 (9.4)	6 (2.6)	19 (5.2)	
Removable Prosthodontics		18 (12.9)	21 (9.3)	39 (10.7)	
Orthodontics		24 (17.3)	102 (44.9)	126 (34.4)	
Oral Implantology, Radiology		10 (7.2)	5 (2.2)	15 (4.1)	
p-value		<0.0001			

The number of oral health related publications in JPDA and PODJ increased more than double in the study period. There were 20 medical/dental colleges in Pakistan by 2007 recognized by Pakistan Medical and Dental Council (PMDC). The number increased to 128 medical/dental colleges by 2013²⁵. The faculty members working in these colleges needed research publications for promotion in their academic rank as required by PMDC and Higher Education Commission. Many Pakistani dentists have returned to Pakistan after obtaining higher research degrees from abroad; and are currently conducting and publishing quality research. There also seems to be increasing awareness now in the country about establishing its own base-line data sets and standards of care, after decade of blindly following imported information. All these factors have possibly contributed towards increasing number of oral health related papers in both PODJ and JPDA.

Every three out of four articles were considered as original article. PODJ published more original articles as compared to JPDA. PODJ percentage was close to a study by Ullah et al²³ mentioning that 84% of the manuscripts published in Journal of Ayub Medical College (JAMC) during 1997 to 2006 were designated as original articles²¹. The bibliometric analysis of the

Journal of Applied Oral Sciences¹⁸ also showed that 96% of the articles published during the three years period (2005-2007) were designated as original articles. However, the percentage of original articles in the present study was much higher than other international journals¹⁹⁻²¹. The “case reports” had the highest percentage in international dental periodicals¹⁹⁻²¹. The main reason behind this high percentage of original articles published in PODJ and JPDA could be attributed to the rules laid by PMDC for publications credit in academic promotions. The PMDC rules provide credit only to first three authors of an original article. Therefore, authors whose main interest is getting academic promotion, work for original articles and try to be among the first three.

Majority of the articles (about 60%) belonged to either epidemiological studies or patients’ series.. Some other studies also reported the same results^{20,21}. Unfortunately, clinical trials which should be given a high priority for researchers did not get a respected place in the list.

Two-third of the articles were in the clinical fields; agreeing with several other studies^{15,17,18,23}. Since most of the researchers in Pakistan are basically clinicians and consequently it is easy for them to work with patients. Furthermore, until recently the majority of the higher training was through clinical fellowships as compared to higher university degrees through combined clinical training. Therefore, the basic science research did not get adequate attention. Currently, many Master’s programs in basic oral health sciences are available in different Pakistani institutions. However, due to shortage of qualified basic science faculty, those having clinical fellowships have been hired to teach these Master’s programs. Nevertheless, qualified basic oral health sciences faculty should become available as more and more basic science specialists will graduate from these Masters’ programs.

Among the “basic sciences” category; oral pathology and community dentistry articles were highest in number. Ullah et al²³ showed that JAMC also published about 35% articles in pathology. However, Ferrazet al¹⁸ reported that Journal of Applied Oral Sciences published most of the articles related to dental materials and community dentistry during the three years period from 2005 to 2007. In almost all bibliometric analyses, community dentistry got the place among the top^{17,18,21,23}. Since community dentistry specialists are trained in research skills and are not involved in clinical work as other specialties; they tend to be more productive researchers.

This study showed that majority of the publications in clinical articles category were in the area of Orthodontics followed by oral and maxiofacial surgery.

Yang et al¹⁵ also reported that these two specialties were on the top of the list in the bibliometric analysis of pediatric dental literature.

This is a preliminary study to assess the pattern of published articles in two dental journals in Pakistan. It is likely to generate further interest in evaluating publication trends in terms of authorship patterns, citation trends, self-citations, geographical location of authors, productivity of institutions, research type, and statistics used. The study will also motivate the funding agencies to support the oral health researchers needed studies such as randomized clinical trials, population-based studies and dental material research.

CONCLUSION

The number of articles published in JPDA and PODJ doubled during the study period from 2003 to 2012. However, the increase lacks in areas such as randomized clinical trials, dental material studies and population-based studies.

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Has the Change in the Medical College Admission Criteria and Integrated Curriculum Improved Academic Performance in First and Second Year; Comparison of the Results of Two MBBS Batches of Government Medical College of Karachi?

Lubna A. Baig¹, Muhammad Athar Khan¹ and Farah Asad²

ABSTRACT

Objectives: To assess the predictive validity of the medical college admission criteria for academic performance and the effect of integrated curriculum on academic performance of MBBS students at :

Setting: Karachi Medical and Dental College.

Methods: Data based study using the results of two batches of KMDC inducted in 2002 and 2003. Data was entered on SPSS-20, ANOVA, ANCOVA, stepwise regression and repeated measures ANCOVA was used for analysis. The study was initiated in 2008 and data analysis completed in 2010.

Results: A total of 100 students results were used with 50 in each batch. The admission score of the batch of 2002 was significantly higher than the batch of 2003 (P-Value <0.001). The students enrolled in 2003 did significantly better in the first year practical marks compared to batch of 2002 (P <0.001). The increase in the score of the practical marks in second year for the 2002 batch was significantly higher than the batch of 2003 (P <0.001). The predictive validity based on the regression analysis with aggregated admission score as an independent variable for first year marks was 23.7% and for second year marks was 91.5%.

Conclusions and Suggestions: The MCAT conducted by CBM was a good predictor of academic performance in first and second year of MBBS. The students in the integrated curriculum had better academic scores compared to students in the traditional curriculum.

Key words: Predictive validity, curriculum, MCAT, PBL, Academic performance.

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خلاصہ:

میڈیکل کالج کے داخلوں کا معیار اور جداگانہ (نصاب) اسکے پہلے اور دوسرے سالوں میں تعلیمی استعداد کا بہترین طریقہ کار کا تعین کیسے کیا جائے۔ کراچی کے دوسری میڈیکل کالج کے نتائج کا موازنہ؟ مقصد: طبی کالجوں کے داخلے کی تعلیمی کارکردگی کی جانچ پڑتال اور MBBS کے مرموبوط نصاب کی تعلیمی کارکردگی کے اثرات معلوم کرنا۔

طریقہ کار: MBBS کے سال دوم کے طالب علموں کے ۲۰۰۲ء اور ۲۰۰۳ء کے نتائج حاصل کئے گئے۔ کمپیوٹر کے شمار یاتی پروگرام SPSS-20 کے ذریعے ان معلومات کو اندراج کیا گیا۔ ANOVA اور ANCOVA ارتباط ANCOVA اور Repeated Measure ANCOVA کو استعمال کر کے نتائج حاصل کئے گئے۔

نتائج: بنیادی طور پر ایک سو طالب علموں کے نتائج کا اندراج ۵۰-۵۰ کے دو گروپ کی شکل میں کیا گیا۔ جس کی بنا پر مجموعی طور پر ۲۰۰۲ کے طالب علموں کو ۲۰۰۳ کے طالب علموں پر فوقیت حاصل ہوئی۔ لیکن وہ طالب علم جو ۲۰۰۳ میں داخل کئے گئے ان کا اسکور ۲۰۰۲ کی نسبت بہتر رہا۔ Pearson کی پیش کردہ کلیہ کی بنیاد پر داخلوں کے اسکور کا تناسب پہلے سال میں ۱۲۳ اعشاریہ فیصد جبکہ دوسرے سال میں

۱۹۱ اعشاریہ فیصد رہا۔

حاصل معالہ: CBM میں کئے گئے MCAT کے جائزے کی بنا پر ثابت ہوا کہ طالب علموں کا معیار پران نصاب کی نسبت نئے نصاب کا تناسب اہلیت بہتر رہا۔

INTRODUCTION

Traditionally in Pakistan students were admitted to medical college after 12 years of schooling and their marks of Grade 10 and grade 12 were used for making

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a merit list and top students were admitted. Aga khan university was the first one in the private sector to introduce the Medical College Admission Test (MCAT), in 1983¹⁻³. Generally the public and private sector medical colleges starting administering MCAT, with a realization that it is a better predictor of academic performance in medical colleges than their high school grades or GPA in Universities^{1,2,4}.

Karachi Medical and Dental College introduced MCAT in 1991, conducted by Institute of Business Administration (IBA). The test conducted by IBA was

not found to be a better predictor of academic performance henceforth it was changed in 2002 and College of Business Management (CBM) started conducting the MCAT^{1,2}. Additionally the admission committee assigned weightage to intermediate (HSC) and secondary school examination (SSC) as a consequence the combined scores (50% MCAT + 40% High School Final + 10% Secondary School Examinations) were used to make the merit list for selecting the top 50 students for medical college.

In 2003, curriculum was integrated horizontally with introduction of PBL⁵. The batch of medical students inducted in 2003 had an integrated curriculum with system based blocks from first year. The system based modules with integration of basic science subjects continued in the second year as well. The batch inducted in 2002 had the traditional discipline based curriculum in first year; in second year their curriculum was integrated horizontally with PBL as one of the teaching strategy. The faculty training took place in writing learning objectives and aligning teaching and assessment strategies with the learning objectives. These faculty training workshops were further developed into a full curriculum mapping exercises. The faculty then developed the curriculum map and felt comfortable in delivering the new curriculum^{6,7}.

It has been seen that the integrated curriculum with Problem-based learning (PBL) as the teaching strategy improves the leaning abilities of the students and the students also like their curriculum^{5,8}. Integrated curriculum when introduced as clinical presentations at the University of Calgary showed that students experienced varied levels of stress related to different courses⁹. The stress of students was less due to volume and complexity of material and more due to ambiguity of expectations and the workload according to students was manageable¹⁰. Integrated curriculum with PBL has been tried in different schools in Pakistan with no compromise on academic performance of students compared to traditional curriculum based approach^{11,12}.

The purposes of this study were to assess the utility of CBM test for predicting academic performance in first and second year of MBBS for the batches inducted in 2002 and 2003 and to assess the effect of integrated curriculum on the academic performance of medical students in the 1st and 2nd year.

METHODS

Four batches of KMDC have been inducted since 2002 this study has utilized the combined admission test scores of two earlier batches and the first and second year scores of basic science subjects. A total of 100 students scores were used for analysis 50 in each batch (2002 and 2003). Aggregated score of admission test

was used as independent variable and scores of students in theory and practical of anatomy, physiology, biochemistry and grand total of first and second year of medical school as dependent variable to do the regression analysis. The maximum marks and the minimum performance level were same for first year and second year.

For assessing effect of new curriculum repeated measures ANCOVA with admission score as covariate was used to remove the effect of variance due to admission score of the two batches. ANOVA was used to compare between group differences in all the exam scores of the two batches.

RESULTS

The total number of students in both batches was 100 with 50 in each batch of MBBS. The students enrolled in 2003 had a lower admission score however they did significantly better in the first year compared to second year. (Table1).

Table 1: Comparison of admission and exam scores of the two batches enrolled in 2002 & 2003

	Batch 2002 Mean + SD	Batch 2003 Mean + SD	p-value*
Aggregated admission score	88.06+5.6	80.54+5.9	<0.001
Grand total of first year	310.54+21.7	335.36+23.2	<0.001
Grand total of second year	553.2+41.2	338.66+22.5	<0.001
First year theory marks	170.48+10.52	172.46+14.43	>0.05
First year practical marks	140.06+16.06	162.9+11.33	<0.001
Second year theory marks	168.06+12.87	177.42+12.36	<0.001
Second year practical marks	173.80+16	161.24+11.91	<0.001

*ANOVA test

The batch inducted in 2002 achieved a significantly higher score in the second year compared to the batch inducted in 2003. When the admission score was used as a covariate the increase in marks from first to second year and the difference in the marks of the two batches was not affected (Table 2).

Table 2: Repeated measures ANCOVA with Aggregated score used as covariate and the results of two batches compared for change in score from first to second year of MBBS

Effect	Test of statistics	Value	F	Hypothesis df	Sig.
FACTOR1*	Pillai's Trace	.026	2.640	1.000	0.107
	Wilks' Lambda	.974	2.640	1.000	0.107
FACTOR1 with aggregated admission score as covariate	Pillai's Trace	.014	1.392	1.000	0.241
	Wilks' Lambda	.986	1.392	1.000	0.241
FACTOR1 with batch inducted in 2002 and 2003 to compare the within subject variance and aggregated admission score as covariate	Pillai's Trace	.918	1092.503	1.000	<0.001
	Wilks' Lambda	.082	1092.503	1.000	<0.001

*Factor 1= total scores in first year with total scores in second year

Repeated measures ANCOVA yielded that the batch of 2002 significantly increased their scores when integrated curriculum was introduced for them for the first time. The score of batch of 2003 did not increase as much over time as they were progressing in the same integrated curriculum however they did better in first year (Table 2). The regression analysis with aggregated admission score as independent variable and first year marks as dependent variable yielded R^2 of 0.237 (23.7%) and for second year marks R^2 was 0.915 (91.5%) (Table 3).

Table 3: Predictive Validity of aggregated admission score for the academic performance in first and second year of Medical College

Corrected Model Dependent Variable	Type III Sum of Squares	df	R Squared	Mean Square	F	p-value
Grand total of first year	15415.911	2	0.237	7707.956	15.104	<0.001
Grand total of second year	151652.594	2	0.915	575826.297	521.680	<0.001
First year theory marks	104.702	2	0.007	52.351	.325	0.723
First year practical marks	13043.328	2	0.408	6521.664	33.422	<0.001
Second year theory marks	2276.732	2	0.128	1138.366	7.120	0.001
Second year practical marks	3970.592	2	0.169	1985.296	9.897	<0.001

DISCUSSION

The aggregated score used for admitting students in 2002 and 2003 is a good predictor of academic performance compared to the CBM's MCAT conducted for admissions at KMDC^{2,3}. The R^2 of 0.237 for first year marks and 0.915 for second year academic performance is much more than the R^2 of 0.049 for first two years as seen in the previous study from the same college¹³. This prediction of first and second year marks based on the MCAT is in conformity with the previous studied done at KMDC and the international studies^{1,2,4,13,14}. These results show that College of Business Management is using a better tool for selecting students. Luqman reported a moderate to weak correlation between pre-admission achievement scores of students and their academic success later in medical school¹⁵. Another study also found that the grade 12 averaged scores had correlation with the overall success in medical education¹⁶.

As has been suggested by earlier authors the admission criteria should also include instruments with higher predictive validity for not only first and second year but for final year exams where the assessment instruments are different than the ones used in first and second year. In another study in Pakistan when students learning approaches match the teaching learning strategies of the school then it increases their

academic performance¹⁷. Hence besides the present criteria of admitting students to medical colleges another method should be added which tests critical skills, learning and problem solving abilities of the entering medical graduates as has been tried internationally^{18,19}.

Another important finding of this study is the effect of integrated curriculum on academic performance of students in first and second year of MBBS. The results show that the students that underwent the integrated curriculum did better in first year and then in second year carried on at the same pace. The batch, which was in the first year in a discipline based curriculum and then had an integrated curriculum in second year, significantly increased ($P < 0.001$) their score in the second year²⁰. The integrated curriculum has been associated with better student's performance in other studies from Pakistan hence the results are in conformity with those studies^{11,12}. This effect of an integrated curriculum is in conformity with other international studies as well^{8-10,20}.

Although these results are from two batches of 50 students in each, nevertheless the experience of introducing an integrated curriculum and its effect on the marks of the students can be used for further improving the quality of education at the college.

CONCLUSION

I would like to conclude by saying that CBM test with weightage given to high school marks is a good predictor of academic performance for the first and second year of MBBS. The integrated curriculum yielded better academic scores of students even though the university exam was on the pattern of traditional teaching. Further research is needed in other institutions to assess the affect of innovative curricula in the Pakistan setting.

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Awareness and Usage of Family Planning Methods amongst Women at Tertiary Care Hospitals of Karachi

Anum Saeed¹, Melissa Mazcari¹ and Kiran Mehtab^{2*}

ABSTRACT

Objective: The objective of the study is to find the awareness and usage of family planning methods among women and the factors responsible for decrease in contraceptive usage at tertiary care hospitals of Karachi.

Method: A descriptive cross-sectional survey was conducted on a sample size of 384 women (ages 15 to 50 years). The sample was taken through non-probability purposive sampling. The study was conducted at Sobhraj Hospital and Civil Hospital Karachi. Study was conducted from November 2013 to April 2014. A structured questionnaire was distributed and collected from 384 subjects.

Results: Over all awareness about family planning methods amongst women was; 84.1% women were aware of oral contraceptive pills, 77.3% women were aware of injectable contraception, 64.3% were aware of IUD, 55.7% were aware of natural methods while 53.1% women were aware of condoms. Regarding getting information of family planning methods; 41% women got information through media, 37.2% women got information through relatives, and for 29.7% doctors were source of information. On the usage of contraceptive methods; 30% of the participants were using contraceptive methods. 29.9% couples used male condoms, 23.4% used injectable contraception, 16.9% used oral contraceptive methods such as oral pills and 6.3% used intrauterine devices, 3.6% did permanent sterilization. Decreased contraceptive prevalence rate in Karachi was due to 59.6% male dominance, 32% lack of awareness, 26.6% associated side effects of different contraceptive, 23.4% religious constraints. 72.4% women were in favors of using contraception.

Conclusion: These results indicate that there is a relation between awareness and usage, The main significant result was reason of women not able to use contraception methods was due to hard stance of husbands and not due to religious reasons, there is a desperate need for the government to increase awareness as well as attitude change for the family members, specially husbands; government needs to revisit it's lady health workers program on family planning awareness, attitude and practices.

Key words: Awareness, usage, family planning, contraceptives, Karachi.

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خلاصہ:

مقصد: اس تحقیق کا مقصد عورتوں میں خاندانی منصوبہ بندی کی معلومات حاصل کرنا اور ان وجوہات کو دریافت کرنا ہے جن کی وجہ سے ان میں کمی آرہی ہے۔

طریقہ کار: تین سو چوراسی (۳۸۴) عورتوں میں ایک عمومی جائزہ لیا گیا۔ یہ تحقیق سول ہسپتال، کراچی اور سو بھراج ہسپتال، کراچی میں نومبر ۲۰۱۳ء اور اپریل ۲۰۱۴ء کے دورانہ میں مکمل کی گئی۔ ایک سوالنامہ ان خواتین میں تقسیم کر کے معلومات حاصل کی گئیں۔

نتائج: جوابات کے تحت ۸۴.۱% عورتوں میں داخلہ گولیوں کے بارے میں معلومات تھیں۔ چونسٹھ فیصد (۶۴%) عورتیں رحم میں رکھنے والی طریقہ داخلہ حمل کے بارے میں جانتی تھیں۔ پچیس فیصد (۵۵%) عورتیں داخلہ حمل کے قدرتی طریقے سے واقف تھیں۔ اکتالیس فیصد (۴۱%) عورتوں کی یہ معلومات ذرائع ابلاغ کے ذریعہ حاصل ہوئیں۔ ۳۷.۲% کو رشتہ داروں کے ذریعے اور ۲۹.۷% کو طبی معالج کے ذریعے معلومات حاصل ہوئیں۔ عام طور سے ۳۰% عورتیں داخلہ حمل کے طریقوں کو استعمال کرتی تھیں۔ ۳۰% مرد حضرات CONDOM استعمال کرتے تھے۔ ۲۳.۴% قابل دخول داخلہ حمل کا استعمال کرتی تھیں۔ ۱۶.۹% داخلہ حمل کی گولیاں استعمال کرتی تھیں۔ ۶.۳% رحم میں رکھنے والی داخلہ حمل کے استعمال کرتی تھیں۔ اور ۳.۶% نے مستقل نس بندی کرائی تھی۔ داخلہ حمل طریقوں کی کمی کی وجوہات میں سب سے زیادہ ۵۹.۶% عورتوں کے فیصلوں میں اقتدار کی نشان دہی کی گئی۔ ۳۲% معلومات کی کمی اور ۲۶.۶% ان طریقوں کی محدود سری پیچیدگیاں اور ۲۳.۴% مذہبی پابندیوں کی وجہ سے داخلہ حمل طریقوں کو استعمال نہیں کر رہی تھیں۔ ۲۶.۶% عورتیں داخلہ حمل کے طریقوں کے استعمال کے حق میں تھیں۔

حاصل مطالعہ: یہ تحقیق ظاہر کرتی ہے کہ آگاہی اور استعمال میں ایک رشتہ ہے۔ عورتوں کا داخلہ حمل طریقوں کو استعمال نہ کرنے کی اہم وجوہات ہوں کے نامعلوم ہونا ہے۔ اور مذہب کی رکاوٹ کی وجہ نہیں۔ یہ وقت کی ضرورت ہے کہ حکومت خاندانوں کے ذہن کو تبدیل کرنے کا خاص کوشش ہوں کے طریقوں کو حکومت Lady Health Workers کے پروگرام میں تبدیلی کرائے تاکہ لوگوں کی واقفیت، انداز اور عمل میں تبدیلی آئے۔

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INTRODUCTION:

Pakistan having the highest population growth is the sixth most populous country in the world⁷. Family planning is a basic tool to improve the health status of the people⁸. Family planning means limiting family size according to the available resources. It not only gives the couples the choice of a planned pregnancy

but is an important means of improving the maternal and child health¹². The contraceptive and reproductive preference is of fundamental importance for population policy and family planning programs. A contraceptive choice varies with the age, ethnicity, marital status, fertility intentions and education¹³. The wide gap between preferences and practice stems partly from a prevailing belief that Islam is opposed to contraception, and concerns about side effects and health hazards of modern contraceptive methods. It also reflects the low political priority given to family planning for much of the last 30 years¹⁰. After nearly 50 years of family planning programs in the country, 96% of currently married women are aware of at least one modern method of contraception, knowledge does not always translate into use⁵. This study is on women's awareness of family planning methods, their method choice, and reasons of women not able to use contraceptives, their knowledge and attitudes toward contraception. This study reflects the overall perception women have towards family planning methods and its counter effect on its prevalence in our country. It seems likely that educational status does not necessarily promise an understanding towards the use of contraceptive methods. An advancing society in Pakistan has not taken into account this dimension of understanding which affects the population and hence the economic life of our country. To know the knowledge and attitude about family planning many studies have been conducted, but passes of time needs to revisit this important society related subject. Therefore, this study was conducted to determine the awareness and uses of family planning methods among females visiting two tertiary care hospitals of Karachi. The objective of the study is to find the awareness and usage of family planning methods among women of Karachi and the factors responsible for decrease in contraceptive usage in tertiary care hospitals.

METHODOLOGY

A Cross sectional study designed for conducting this study at Sobraj and Civil hospital on women (age 15 to 50) which included primipara, multipara and grand multipara. Karachi, Pakistan. The sample size was 384; which was calculated by using the standard formula for calculating sample size on the basis of prevalence of 59.9% with the bound of error of 5% and 95% confidence interval. Sample was divided equally between both hospitals of Karachi and sample was selected through non-probability purposive technique. The study period was from November 2013 to April 2014. The inclusion criteria was the women of age 15

to 50 years which included primipara, multipara and grand multipara. The exclusion criterion was women without children. Three hundred and eighty four questionnaires were distributed among the women of age group 15-50 years attending both hospitals. Before distributing questionnaires a 5 minute briefing was given to participants, explaining the purpose and different aspects of the study. All questions from participants was entertained and each question in questionnaire tool were explained

All participants were assured of confidentiality of information. Participants were given 20 minutes to respond to the questionnaire. All questionnaires were willingly completed by the participants. Statistical software SPSS version 17 was used for Statistical analysis. Mean and standard deviation were used to describe numerical variables like age. Frequency and percentages were used to describe all categorical variables.

RESULTS

On educational level, 36.2% participants had qualified secondary grade, 22.9% primary school passed, 20% were illiterate, 14.6% had cleared intermediate and 6.3% were graduates. Ninety four percent women were housewives. Over all awareness about family planning methods amongst women was; 84.1% women were aware of oral contraceptive pills, 77.3% women were aware of injectable contraception, 64.3% were aware of IUD, 55.7% were aware of natural methods while 53.1% women were aware of condoms.

Regarding getting information of family planning methods; 41% women got information through media, 37.2% women got information through relatives, for 29.7% doctors were source of information, for 22.7% friends were the source of information and 14.3% women got information through Lady Health Worker. On the usage of contraceptive methods; 30% of the participants were using contraceptive methods. 29.9% couples used male condoms, 23.4% used injectable contraception, 16.9% used oral contraceptive methods such as oral pills and 6.3% used intrauterine devices, 3.6% did permanent sterilization. Thirty percent women were visited by health worker. Nineteen percent women visited family planning clinics.

Decreased contraceptive prevalence rate in Karachi was due to 59.6% male dominance, 32% lack of awareness, 26.6% associated side effects of different contraceptive, 23.4% religious constraints. Seventy two percent women were in favors of using contraception.

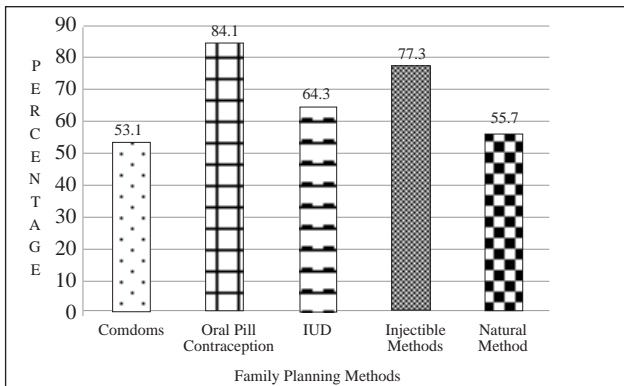


Figure 1: Distribution of Participants by Education Level

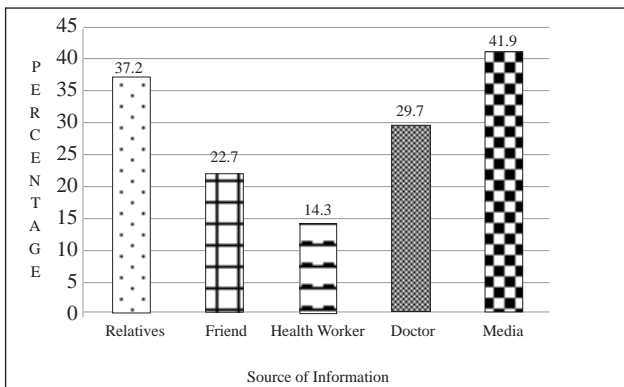


Figure 2: Frequency Distribution of Source of Information

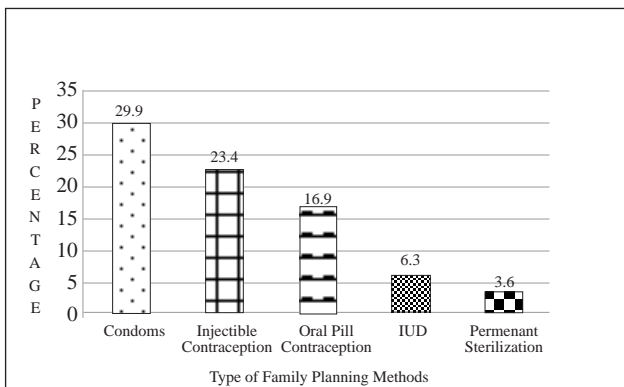


Figure 3: Frequency Distribution of Usage of Different Contraception Methods

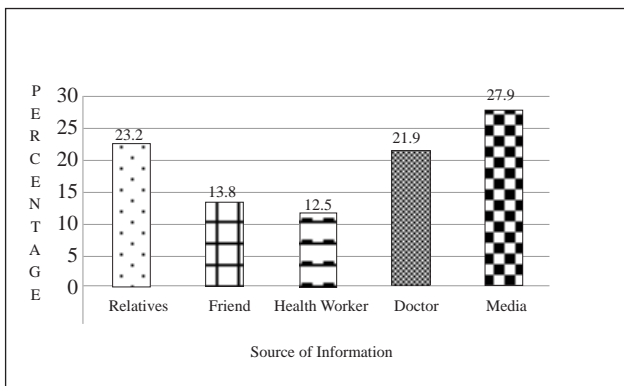


Figure 4: Comparison of Usage with Sources of Information

DISCUSSION

Family planning method is the means to improve the quality of life for both the individual and the community. The Ministry of Population, Government of Pakistan, launched a family planning project two decades ago. This focuses on implementing different campaigns through electronic and print media, and also on door to door education on the avoidance of unplanned child birth¹⁵. Our finding revealed increased awareness among married women on at least one mode of contraceptive method

Our findings revealed that couples do not practice contraception consistently because of partner objections being 59.6% with 26.6% concerned about side effects and 23.4% bound to religious constraints. In this way, stressing the male dominant set up in our society where the choice of family planning method is strongly dependent on the consent of husband. Hence involvement of males should be incorporated in future family planning initiatives⁴. However our research has failed to examine the opinion of men towards family planning method, thus failing to analyze the flaw in their understanding. Also from our analysis it has come to light, that 93.5% women are house wives in Pakistan.

Health workers are discrete, known to the women, easily accessible and able to advice women¹¹, though unexpectedly the data from our analysis indicates a trivial effort on part of the health worker owing to only 30% visits by the lady health worker. Around 100,000 lady health workers are working in Pakistan still only 14.3% women got information from them. Lady Health workers (LHW) program is perhaps Pakistan's best bet to providing comprehensive reproductive healthcare and family planning¹². it also draws attention to the inadequacy of the role of community and government in mobilizing the two indicators that in still family planning methods. There is a need of increasing public education regarding the resources available to women in Pakistan.

Awareness and knowledge of different contraceptive methods is the key point in the adaptation of family planning and making a choice for a particular method. Although nearly all the respondents knew at least a single method of contraception, current contraceptive practice was far from the ideal⁹. Even though 84.1% women knew about oral contraceptive pills only 16.9% women used it. 77.3% women were aware of injectable contraception and the usage is only 23.4% similarly 53.1% women were aware of condom but the usage was 29.9% and 64.3% women are aware of IUD and only 6.3% women have been using it, thus highlighting the disparity between the awareness and use of Contraception. Some awareness about contraception is present but social factors affect practice⁸.

Nevertheless, usage was greatest for male condom 29.9% and least for permanent sterilization 3.6%, providing that the easy accessibility of condom, the simplicity of its use and a low incidence of side effects have aided its increased use. Then again, this trend indicates an acceptance of less effective family planning method and a neglected attitude of users towards tubal ligation; which is an important factor in producing large family size¹².

The study proved age influence the understanding of family planning method and its use, 14.8% women aged 25 years, 12.8% women at the age of 30 with 5.2% at the age of 35. However a decline is seen with increasing age as only 0.5% women at the age of 47 are using family planning method. Hence it owes to the strong faith in decline in the fertility with increasing age. On the other hand 0.3% of 17 year old married women are using contraceptives. Unfortunately contraceptives in teenagers were less in contrast to advanced countries, thus there is need to promote and accelerate family planning measures in youngsters to decrease birth rate¹.

The main limitation of study was restricted availability of resources thus our method was convenient sampling. We couldn't access all districts of Karachi due to security concerns; therefore our result does not necessarily represent the view of entire population of Karachi.

CONCLUSION

These results indicate its awareness and usage both are very low in our city even in spite of its easy availability by the government. The main significant result was reason of women not able to use contraception methods was due to hard stance of husbands and not due to religious reasons, there is a desperate need for the government to increase awareness as well as attitude change for the family members, specially husbands; government needs to revisit its lady health workers program on family planning awareness, attitude and practices.

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Customer Satisfaction, a Tool for Improving Health Care Services: An Approach to Customer in Pharmacy Settings

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ABSTRACT

Background: Pharmacy area is an important part of healthcare system, where the pharmacists interact with patient and try to provide services to the best of their ability. The goal is to maximize positive health care outcome and improve patients' quality of life with minimum risk. For this purpose there are versatile, retail drug stores and hospital pharmacies, however the quality of this facility vary according to the socioeconomic behavior and circumstances.

Objective: The aim of present study is to examine the proportion and quality of healthcare facilities that are being provided in different areas of Karachi and to determine the level of satisfaction of customer about the attitude and level of literacy of the drug seller or occasionally Pharmacist.

Method: A survey was conducted among the customer at different pharmacy settings of multiple areas of Karachi. The population covered was 200 customer and they were asked to answer a 10-point questionnaire. Descriptive statistics on sample characteristics was calculated and response was summarized as percentage of positive or negative.

Conclusion: The study showed that the populous city needs to develop more pharmacies to fulfill the demand of customer and to hire literate persons. Consequently this has become a challenge for pharmacy practice to fulfill the needs of the community by concentrating on customer dealing and skill of pharmacy staff accordingly.

Key words: Pharmacy, Pharmacist, Customer, Healthcare, Socioeconomic.

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خلاصہ

علم الادویات اس لحاظ سے اہمیت رکھتا ہے کہ ماہرین علم الادویات ان تمام دواؤں کی افادیت کے ادارک رکھتے ہیں۔ جو میڈیکل اسٹور کے ذریعے عام عوام اور بیماروں کو فراہم کی جاتی ہیں۔ اس سلسلے میں ایک سوالنامہ ترتیب دیا گیا۔ اور کراچی کے مختلف علاقوں میں ادویات کی فراہمی اور ان کے معیار کا جائزہ لیا گیا۔ اس کے علاوہ ان اسٹور کے مالکان اور دوا فروش کی ادویات کے بارے میں معلومات کا معیار معلوم کیا گیا۔ دو سو (۲۰۰) افراد سے ایک سوالنامہ کے ذریعے جوہ اسوالوں پر محیط تھا اس سلسلے میں رائے لی گئی۔ جوابات کو فی صد اور مکمل تعداد کے ذریعے ظاہر کیا گیا۔ تحقیق بتاتی ہے کہ اس شہر میں مزید فارمیسی کی ضرورت ہے۔ اس کی کو پورا کرنے کے لئے فارمیسی پر کام کرنے والوں کو مزید توجہ اور محنت کی ضرورت ہے تاکہ گاہک مطمئن ہو جائیں۔

INTRODUCTION

Pharmacists are key members of the health care personnel accountable for the quality use of medicines and are considered as most trusted proficient^{1,2}. This fact has been accepted worldwide for monitoring the tertiary healthcare and to develop the discipline of community health Pharmacy³. To explore pharmacists'

responsibilities with respect to public health, the outlook of the customer is also very significant⁴. An analysis of patients' perception regarding information about health and medicines and satisfaction from the role of pharmacy settings in their community plays an adequate role for the progression of complete compliance with health safety interventions⁵.

The services provided by community pharmacies have vital role as a primary health care resource to local populations. Though, variations in service provision are observed to exist among the pharmacies of different localities due to the different surroundings. Qualitative estimation shows that the environmental differences due to location markedly influence the service provided. In these frame of facts, the quality of services in urban localities and rural areas needs additional improvement⁶. The last two decades, the social behaviors, marketing strategies and media resources have influenced the demand of consumers and developed their urge of

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seeking information^{7,8} hence the current consumer is more learned, better educated, and more informed as compared to pass two decades. In today's global world patient or customer is a member of health care system and his feeling of satisfaction strengthens the system accordingly¹¹⁻¹³. Keeping in view the customer care different studies have been carried out in many countries in order to overcome the hurdles and stress related to the pharmacy services. Depending on these facts the present study was also aimed to analyze and minimize the health related issues faced by our customers.

METHODOLOGY

A survey based method was adopted through which views and knowledge of customers was considered. The customers of different areas of the populous city Karachi were assessed through a 10 item questionnaire and their level of satisfaction was evaluated hence to observe problems faced by the customers and the attitude they come across. Some pharmacist were conveniently chosen for the study and a questionnaire consisting of ten questions about the pharmacy area facilities previously developed and was distributed among three hundred fifty customers thirty two returned the duly filled questionnaire the retrieved questionnaires were analyzed by the Statistical software SPSS-17. Through which frequency and percentages were calculated. Statically the test applied is chi square to check influence of age, gender and locality on response.

RESULTS AND DISCUSSIONS

Out of 350 questionnaires distributed, 232 filled questionnaires were returned. Response rate was 66%. Fifty eight were males and 42.7% were females. The most prevalent age group was 26-35 years (33.6%). Mostly were living in high income areas of metropolitan city Karachi. Very few were from low income area as most of them (53%) they were not able to read and answer the questionnaire written in English. Many studies were conducted worldwide to observe the consumer satisfaction and perception about community pharmacies¹⁴⁻¹⁷. To the best of our knowledge this is the first type of study conducted in Pakistan to gather the attitude of consumers towards pharmacy services. Study population characteristics are mentioned in Table 1.

Out of 232 respondents, 209 (87.5%) thought that they have pharmacy store near their homes. A majority of respondents (90%) opined that the opening hours were feasible to them and people at pharmacy were able to speak different languages (42.2%). As pharmacy should be in the locality where only prescription and non-prescription drugs are sold, however majority of respondents (75%) can purchase other items from the nearby pharmacy.

Table 1: Demographics of study population

Characteristics		Frequency	Percentage
Gender:	Male	133	57.3
	Female	99	42.7
Age:	Less than 25 yr	41	17.7
	26-35 yrs	79	33.6
	36-45 yr	63	26.7
	more than 45 yr	49	21.1
Locality:	low income area	18	7.8
	middle income area	90	38.8
	high income area	124	53.0

Customer satisfaction is the utmost priority of any business. Respondents were complained about long waiting (68%) and cleanliness (64.7%). Pharmacists should speak politely to their customer whether patients or ordinary person. This was observed in the study that respondents were not treated well when they come to the pharmacy (69%). Mostly did not get efficient service at community pharmacies (87%). In Pakistan community pharmacies are not yet well established, this situation should be properly addressed. Chi square test was applied to observe the influence of age, gender and locality on the response of customers and statistically significant results are depicted in Table 2.

Table 2: Significant results of Chi-square test for age, gender and locality on responses

Question	Chi-square value	p-value
Q4 verses age	11.07	0.011*
Q6 verses age	10.17	0.017*
Q4 verses gender	8.041	0.005*
Q7 verses gender	6.485	0.011*
Q3 verses locality	8.15	0.043*
Q7 verses locality	11.05	0.011*
Q8 verses locality	11.09	0.011*

Key: * is indicating the significant association

CONCLUSION

The present study signified the need of taking action to improve pharmaceutical services provided at community level. This initiative should be taken from both side i.e. DRAP (drug regulatory authorities Pakistan) as well as pharmacy business owner or corporate sector. This will not only develop confidence of patients on health care system but also increase customer satisfaction which positively imparts pharmacy business in Pakistan

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ABBREVIATIONS AND SYMBOLS

Use only standard abbreviations; the use of non-standard abbreviations can be extremely confusing to readers. Avoid abbreviations in the title. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

PROTECTION OF HUMAN SUBJECTS AND ANIMALS IN RESEARCH

When reporting experiments on human subjects, authors should indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. If doubt exists whether the research was conducted in accordance with the Helsinki Declaration, the authors must explain the rationale for their approach, and demonstrate that the institutional review body explicitly approved the doubtful aspects of the study. When reporting experiments on animals, authors should be asked to indicate whether the institutional and national guide for the care and use of laboratory animals was followed

Piperidine - An Important Medicinal Moiety: A Review of its Derivatives as Excellent Analgesics

Zafar Saied Saify¹ and Kiran Rafiq²

ABSTRACT

Being an alkaloid and a fragment of morphine, piperidine itself and its derivatives are invasive component for the synthesis of many chief and significant pharmaceuticals. Their medicinal use as analgesic is very ancient and is acknowledged to possess the ability for blocking prostaglandins effects through inhibition of downstream signaling pathways. The present review reflects the marvelous role of piperidine derivative in controlling pain and inflammation. This dimensional pharmacological and biological characteristics have drawn the attraction of researchers and for a long period, specially from two decades, it has become an important area of designing new analgesic moieties along with more excellent therapeutic effects for medicinal chemists, as a result of that thousands of synthetic derivatives containing piperidine with potent activities have been developed and hundreds in a way.

Key words: Piperidine, alkaloid, analgesic, morphine.

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خلاصہ

پائپرڈین ایک الکالائیڈ اور صارفین کا اہم جز ہونے کے باعث بہت سے ادویات مرکبات کی تالیف میں استعمال ہوتا ہے۔ درد کشا کے طور پر اس کا استعمال بہت قدیم ہے اور یہ درد کشائی کے عمل میں پرسٹاگلینڈین کی رکاوٹ کے ذریعے حیاتی کیمیائی شاہراہوں کو بند کر دیتا ہے۔ جو درد کا باعث بنتی ہیں۔ موجودہ تھیرہ پائپرڈین کی بے انتہا موثر خوبیاں اور درد کشائی کی وضاحت کرتا ہے۔ اس مالیکیل کے ان ہی کثیرالطرفہ خواص نے محققین کی توجہ بالخصوص گزشتہ دو دہائی سے اپنی طرف مبذول کرائی ہے۔ اور اب پائپرڈین درد کشا ادویات میں ایک اہم مقام حاصل کر چکا ہے۔ اور اس کے نتیجے میں ہزاروں ادویاتی مرکبات وجود میں آچکے ہیں اور کئی سوزیریکمیل ہیں اور مستقبل میں ان پر کام جاری رہے گا۔

INTRODUCTION

Piperidine has been recognized as remarkable moiety having outstanding biological and pharmacological approaches. It belongs to the class of opiate analgesic, pharmacologically resembles morphine (Fig. 1 & 2).

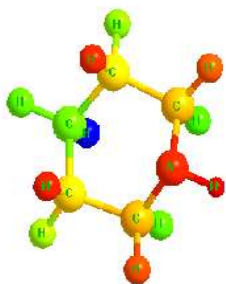


Figure 1: Piperidine

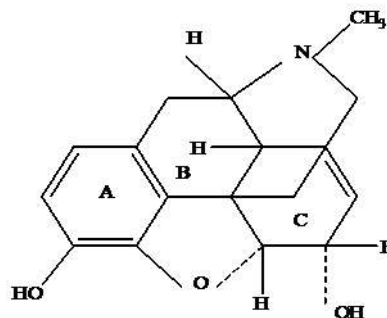
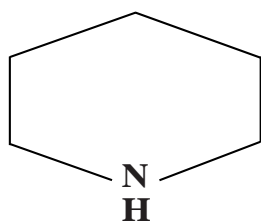


Figure 2: Morphine

History and Background: In 1947 some piperidine derivatives were assessed and were found more potent analgesic like morphine, comparatively in smaller doses¹. In 1960, 1-(1-Phenylcyclohexyl) piperidine . HCl was proved to produce analgesic and anaesthetic effects in experimental animals successfully². During this period a long series of substituted piperidines were synthesized and as a result of that different piperidine ring containing diversified and outstanding analgesics like Pethidine, Fentanyl, Ohmfentanyl, Bemidone and Ketobemidone were developed^{3,4}. Furthermore piperidine

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moiety was substituted via variety of synthetic reactions to develop more improved derivatives with enhanced activities and to suppress the side effects when used as medicine for a range of ailments⁵⁻¹¹.

Occurrence and Source: Piperidine is an important constituent of black pepper from family Piperaceae. Piperidine, as an alkaloid (Piperinoyl-piperidine) responsible for the pungency of pepper fruit to some extent^{12,13}. In family Piperaceae, *Piper longum*, *Piper nigrum* and *Piper cubeba* are other most famous plants¹⁴.

Piper nigrum (black pepper) has an important therapeutic value, as it plays significant role in cough, fever, inflammation, muscular spasm and also has bactericidal, antioxidant and radical scavenging properties^{15,16}. Along fruit, its oil has important therapeutic uses specifically for digestion¹⁷. The berries of *Piper cubeba* (Java pepper or tailed pepper) commonly known as cubeb, is cultivated in Java and Sumatra and is effective for the treatment of pain, gastrointestinal disorders, inflammation of liver and bronchospasm¹⁸. Pulverized white pepper contains as much as 1322 ppm, and black pepper contains < 703 ppm^{19,20}.

Piperidine alkaloids were also found in *Cassia leptophylla*. Several piperidine alkaloids were isolated from the seeds of *African legume* and some which extracted from its bark found to have potent inhibitory activity toward alpha L. fucosidase²¹. Analysis of stem extracts of *Piper guineense* resulted in the detection and identification of thirty nine new isobutyl, pyrrolidyl and piperidyl amide alkaloids²². Pepper has been an important spice, flavoring agent and used for the treatment of asthma, bronchitis, pyrexia, insomnia and abdominal disorders in folklore medicine²³. *Piper longum* (long pepper) is cultivated in the west of India specifically that has been a conventional remedy for digestive disorders²⁴. In last two decades Piperidine derivatives were synthesized and its pharmacologically strong substituted moieties made a long and uncountable record. The successful studies of piperidine derivatives encouraged drug designers to evaluate their three dimensional biological and therapeutic responses including analgesic, diuretic, antineoplastic, antinociception, anti-inflammation alpha glucosidase inhibition, antidiabetic, antifungal and antibacterial^{25,26}.

Piperidine Derivatives As Excellent Analgesics: In the field of medicinal chemistry significant work has been done for the development of Piperidine as the most hopeful origin, ramification of various promising compounds and novel therapeutic agents.

Piperidine belongs to the family of nitrogen containing heterocyclic compounds, a part of numerous naturally occurring alkaloids and it behaves like a secondary amine²⁷. Piperidine constitute a fragment of morphine

molecule namely 4-Phenyl piperidine moiety. Various derivatives of morphine were basically the result of very slight modification in the molecule²⁸ and hence as a result of minor changes, some very useful compounds were discovered with greater activity than morphine^{29,30}.

The substituted piperidine molecule exhibited potential therapeutic properties due to the structure activity relationship and good receptor binding and considered as a leading nucleus having potent pharmacological activities hence are used widely for the management of pain and inflammation³¹.

There is a long series of piperidine derivatives which has proved potent antinociceptive agent (Fig: 3-6).

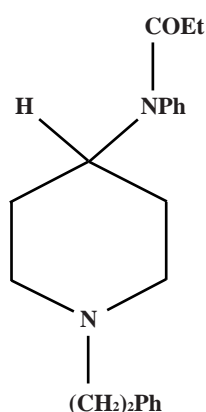


Figure 3: Fentanyl

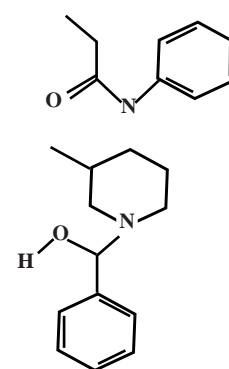


Figure 4: Ohmefentanyl

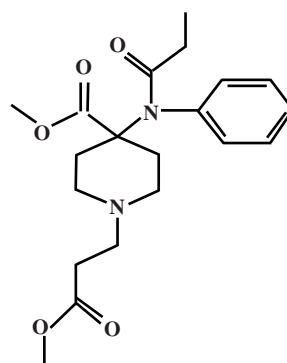


Figure-5: Remifentanyl

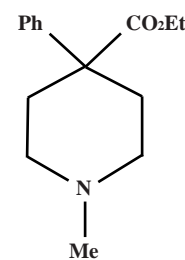


Figure-6: Pethidine

Among them Fentanyl, synthetic opioid analgesic, was derivatized from 1-Phenethyl-4-piperidone, exhibited a better profile of activity as compare to morphine^{32,33}.

Ohmefentanyl is an extremely potent analgesic agent with highest receptor affinity and selectivity for the opioid μ receptors. Its eight optically active isomers were possible³⁴. Remifentanyl was also found to be an effective anaesthetic agent that is responsible for providing optimal analgesia and sedation. Pethidine is

a piperidine ring containing compound having strong opioid analgesic activity, more potent than codein and controls the pain of smooth muscle spasm³⁵.

Ketobemidone and Bemidone are more efficient analgesics also having piperidine ring but found to show addiction³⁶.

Several p-substituted phenacyl piperazine and piperidine derivatives were prepared and analyzed for the analgesic activity. Different compounds exhibited varying degree of analgesic activity as the carbinol derivatives were found to exhibit the highest potency³⁷⁻³⁹. Number of other piperidine derivatives having significant analgesic activity were synthesized by different workers, one was proved to be a novel μ -opioid receptor selective ligand. Some 1, 4-substituted piperidine derivatives were experimentally proved strong antinociceptive agent. Depending on the studies that piperidine has strong anti-inflammatory activity, different derivatives were prepared, among them one was found tachykinin receptor antagonist, useful in the treatment of pain, inflammation, migraine, neuralgia, depression, anxiety and also showed affinity for human NK-1 receptor⁴⁰.

Pharmacology: The analgesic activity engages a multifarious communication of nervous system from the skin and the muscle tissues to the brain. The opioid receptors are responsible for producing nociception and also cause antinociception effects. It is closely connected with all CNS areas⁴¹. These receptors are the combination of that is seven-transmembrane domain (7TM) receptors and. Hence the facts reveal that the analgesia and antinociception are closely and strongly associated with binding of opioid receptor with a suitable psychoactive chemical, an opiate^{42,43}. These compounds cause analgesia by blocking the signaling pathways against pain. Depending on these important facts about the antinociception and analgesic behavior of piperidine ring containing compounds, the synthesized piperidine derivatives were screened for the analgesic response.

CONCLUSION

Piperidine ring containing compounds are identified as potent analgesic. Consequently extensive research has been done for the substitution of piperidine to get better moiety for the management of pain^{44,45}. Pethidine, fentanyl, inovan, ketobemidon, bemidone and a variety of molecules are the result of these efforts⁴⁶⁻⁴⁸. Further structural modification can lead to achieve good quality analgesics with little side effects^{49,50}. In this framework, more competent analgesic moieties can be synthesized and can be proved as strong pharmaceutical formulations.

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Diabetic Retinopathy

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ABSTRACT

Diabetic retinopathy is a major micro vascular complication of Diabetes mellitus that usually leads to blindness in working age adults throughout the world. Risk of diabetic retinopathy increases in patients of type 1 and type 2 diabetes having hyperglycemia, blood pressure, oxidative stress, inflammation and micro/macro vascular complications. Diabetes affects all the 4 major types of retinal cells and interferes in their proper functioning. The purpose of this study was to understand the pathophysiological pathway behind the development of diabetic retinopathy and initial and long-term effects of insulin treatment on behavior of DR. Contents of this articles are based upon various studies and clinical trials conducted in various countries of the world showing the retinal cells structure, alteration of retinal cells in diabetes, pathophysiology of DR, blood-retinal barrier breakdown, Retinal micro vascular dysfunction and use of Insulin its effect and various other therapies. In addition this study also shows the relationship between the developments of cognitive impairment due to DR. finally, an overview of various drug therapies has also been provided. It showed that in addition to use of insulin to delay the worsening of DR, laser therapy, intravitreal anti-Vascular Endothelial Growth Factor treatment, steroidal injections and carbonic anhydrase inhibitors cause significant stabilization or even improvement from diabetic retinopathy.

Conclusion: From this study, it can be concluded that now a days in young adults DR is a challenging disease to manage due the high prevalence of Diabetes mellitus. This review demonstrates that with the current concepts and novel therapeutic approaches diabetic retinopathy can be managed. Regular screening examination and self-monitoring of blood glucose can reduce the extent of DR related visual impairment. Other new therapies are in pipeline, and forthcoming randomized clinical trials are required to study the effect of all these novel therapies.

Key words: Diabetic Retinopathy (DR), Diabetes Mellitus (DM), Vascular Complication.

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خلاصہ

ذہنی بصری عرصے کا غیر سوزشی مرض

آنکھوں میں جانے والی خون کی رگوں میں رکاوٹ کی بنا پر بینائی پر مضر اثرات رونما ہوتے ہیں۔ جسکی وجہ سے ذہنی عرصے کی وجہ سے بڑھاپے میں نابینا ہونے کی وجوہات میں اضافہ ہو جاتا ہے۔ یہ خاص طور پر ذہنی عرصے کی قسم اول اور دوم میں خون کی دباؤ میں زیادتی۔ آنکھوں کی سوزش۔ اور رگوں کی تنگی کی بنا پر رونما ہوتا ہے۔ ذہنی عرصے کی Retinal Cells کے چاروں اقسام اور اسکے طریقے کار پر اثر انداز ہوتی ہے۔ اس مطالعے کا مقصد تشخیصی طریقے کار کی بنا پر انسولین خاورے کی کمی یا زیادتی پر سے ذہنی عرصے کی مریضوں اور انکی بینائی پر ہونے والے اثرات کا جائزہ لینا ہے۔ جو بصارتی عرصے میں خون کی زیادتی کی بنا پر بینائی کی متاثر کرتی ہیں۔ انسولین کے ذریعے علاج کے علاوہ دوسرے ادویاتی طریقے کار کا جائزہ لیا گیا ہے۔ جس کی بنا ڈیٹھی نقص پیدا ہونے کا امکان ہوتا ہے۔ بصارتی عرصے کی خرابی کو روکنے کے لئے لیزر شعاع میں۔ اسٹورائڈ کے انکیشنز۔ کاربوئک انہائیڈریز کا استعمال مفید ہوتا ہے۔ اس جائزے سے ذہنی عرصے کو خود تشخیصی طریقے کی بنا پر انسولین کی کمی یا زیادتی کو کنٹرول کیا جاسکتا ہے۔

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INTRODUCTION

Diabetes mellitus has become a serious challenge for health care organization throughout the world due to its wide-ranging occurrence and economic burden. DR is a major micro vascular complication of Diabetes mellitus that usually leads to blindness in working age adults throughout the world¹. The risk of vision loss according to World Health Organization is expected to be double till the year 2030, if the ratio of DM epidemic increases with current rate². According to International diabetes federation by year 2025, DM is expected to affect 380 million population³. A survey data showed that out of 10 diabetic patients 1 having diabetic retinopathy which can be controlled by keeping

the glycemic values in normal range⁴. Risk of Diabetic retinopathy increases in patients of type 1 and type 2 diabetes having hyperglycemia, blood pressure, oxidative stress, inflammation and micro/macro vascular complications⁵.

DR is a disease caused by damage of small blood vessels of retina due to high level of blood glucose in poorly controlled diabetic patients and may lead to increased retinal vascular permeability, retinal ischemia, proliferation of retinal vessels and vision loss⁶. All the patients suffering from type 1 diabetes develop this disease and ratio is above 60% in those having type 2 diabetes⁷⁻⁸. This review translates the cell types and common treatments of diabetic retinopathy. Alteration in retinal cells takes place in this disease which leads to retinal inflammation and macular edema⁹.

Studies:

A study based on clinical data was performed in Japan among 383 type 2 diabetic Japanese patients to check the progression and prevalence of diabetic retinopathy in males and females. Females displayed a considerably higher prevalence of proliferative DR as compared to male¹⁰. Another study was conducted in a large European cohort Gutenberg Health Study (GHS), in which a population of prediabetic patients was included to determine the association of DR with cardiovascular risk factors. No association was found between diabetic retinopathy and cardiovascular risk factors such as dyslipidemia, chronic obstructive pulmonary disease, stroke, congestive heart failure, smoking, history of myocardial infarction, chronic kidney disease, coronary heart disease, obesity and peripheral artery disease¹¹.

50% of patients with early onset of diabetes of any type between ages 10 to 25 years develop retinopathy with 10 to 12 years of diabetes history, and have a great need of regular eye screening, tight glycemic control and normal blood pressure for prevention of diabetic retinopathy¹².

Retinal Cells:

Diabetes affects all the 4 major types of retinal cells: 1) Endothelial cells and Pericytes, 2) glial cells, 3) neuronal cells, 4) microglial cells⁹. Glial cells control metabolism of retina and regulate function of blood vessels and neurons that's why these cells can also be termed as support cells¹³. The second class of cells contains neurons, which transmit nerve impulses to brain through optic nerve and nerve fibers of axons. Microglial classes of cells involve tissue macrophages which are very sensitive to retinal homeostasis and become phagocytic as the homeostatic state of the retina changes¹⁴. Neurons involve four types of cells such as ganglionic, amacrine, photoreceptors and

bipolar cells which perform photo transduction and facilitate accurate vision¹⁵.

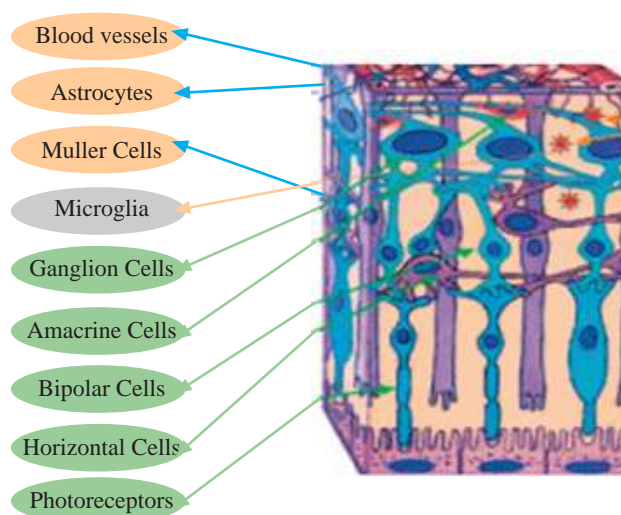


Figure 1: Schematic diagram retinal cell types Microglia cells (muller cells and astrocytes), vesicular neurons (bipolar cells, amacrine photoreceptors and ganglion cells)

In diabetes their disturbance leads to diabetic retinopathy and vision loss. Smooth muscle cells of capillaries known as pericytes and endothelial cells are lining of blood vessels which by contraction and dilation regulate retinal blood flow and homeostatic functions by constituting blood-retinal barrier respectively. Astrocytes and Müller cells are the two basic types of macroglia which assimilate neuronal and vascular activity in the retina⁹. For normal vision accurate function and assimilation of all these cells are required, disruption of any of them may impair vision. The blood flow to retina auto regulate in response of any stimulus influence locally or systemically¹⁶, impaired metabolism of retina in diabetes disturb the function of auto regulation of retinal circulation¹⁷.

Role of ROS in DR

In DR various biochemical changes takes place that disturb the functioning of retina by changing its microscopic structure. These biochemical changes occur when due to elevated serum glucose level, proper retinal metabolism can't take place and as a result retinal oxidative stress (ROS) formation takes place. These species cause up regulation of retinal vascular endothelial growth factor (VEGF), DNA, proteins, and lipids, and ultimately cause cell death. On the other hand antioxidant defense mechanism also becomes impaired in DM, so ROS has a great contribution in not only DR development but also in its worsening and progression in case of diabetes Mellitus¹⁸, diabetic macular edema (DME) and proliferative diabetic retinopathy¹⁹. Thickening or presence of hard exudates

in retina within one disc diameter of the center of the macula is known as Diabetic macular edema²⁰; The early treatment of Diabetic Retinopathy Study Research Group²¹; Klein et al.²², Neelakshi et al.²³. Visual loss in most of the patients with DM is caused by Diabetic macular edema. The occurrence of Diabetic retinopathy (DR), Proliferative DR (PDR) and vision threatening retinopathy was estimated globally and found to be 93 Millions, 17M and 28M respectively²⁴.

In any of the following three conditions diabetic macular edema becomes significant macular edema: (1) in the center of the macula, retinal thickness is or within 500 micro meter, (2) in the center of the macula, hard exudates is or within 500 micro meter if associated with thickening of the adjacent retina, (3) in the center of the macula, zone or zones of retinal thickening of at least one disc diameter in size or of which is within one disc diameter (The Early Treatment of Diabetic Retinopathy Study Research Group²¹).

Paradoxical effect of insulin therapy on DR:

When intensive insulin therapy is given to patient of DM it provide short term worsening of DR at earlier stages but long term therapy leads to slow down the progression of DR²⁵. In this review the comparison of two studies were done, first study was a 10 year diabetes control and complication trial (DCCT) in which patients showed improvement in reduction of DR progression and macular edema (DCCT, 1995), not from the onset of insulin therapy but after 7 years of continuous treatment (DCCT, 1997). According to United Kingdom prospective diabetes study (UKPDS) insulin have long term beneficial effects on DR in type 2 DM. first study showed reduction in progression of DR 27% in primary cohort and then 34-76% in DCCT in patients of type 1 DM, and 25% in type 2DM in UKPDS (UKPDS, 1999).

The pathophysiology behind the early worsening of DR due to intensive insulin therapy is still not clear but appearance of macular edema and exudates provide a link of breakdown of blood retinal barrier. Retinal vascular endothelial growth factor (VEGF) expression increases when insulin bind to HIF-1 α , and VEGF promoter become activated and give rise to VEGF transcription through phosphatidylinositol 3-kinase (PI3K), N-terminal kinase and mitogen-activated protein kinase (MAPK) pathways. In DM increased VEGF causes breakdown of blood retinal barrier²⁵⁻²⁶ as shown in figure 2.

Endothelial cells that disturb to perform its proper function due to hyperglycemia and show a metabolic control by insulin therapy²⁷. John F. Payne & Vin Tangpricha hypothesized that hypovitaminosis D cause

worsening of DR, as diabetes cause hypovitaminosis D and tremendous effect of diabetes has seen on angiogenesis, control of blood pressure, insulin secretion, glucose tolerance and inflammation²⁸.

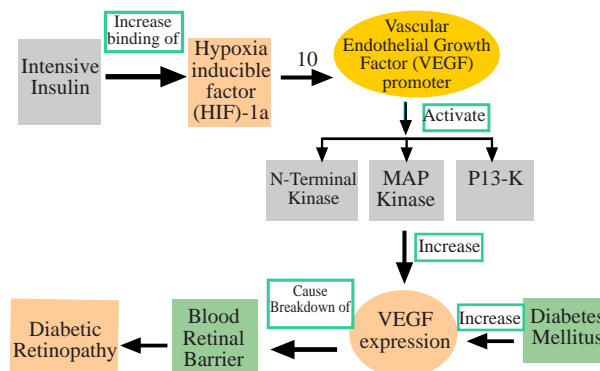


Fig 2. Early worsening of DR with intensive insulin treatment

DR and Cognitive impairment:

Cognitive impairment and dementia is a recently identified complication of diabetes²⁹⁻³⁴. Cognitive impairment is the existence of degree of cognitive dysfunction between dementia and normal aging³⁵. In diabetes 20-60% risk of cognitive impairment considerably increases^{30,31,34,36-42}. Blood brain barrier is similar to blood retinal barrier and high blood glucose level cause micro vascular damage in that retinal barrier⁴³. Patients who have retinopathy have increased risk of cognitive impairment. Level of association between Cognitive impairment and DR is significantly greater for patients with diabetes. A review was conducted on the relationship between diabetic eyedisease and cognitive impairment in Type 2 diabetes to determine the level of association between diabetic retinopathy and cognitive impairment. 10 studies were included and 3 out of 10 studies showed a level of association between diabetic retinopathy and cognitive impairment. All these studies showed an increased risk of cognitive impairment in patients with diabetic retinopathy, but none of the study showed the relationship of severity of DR and cognitive impairment³⁵.

Drug therapy to treat Diabetic Retinopathy:

To treat patients with diabetic retinopathy, insulin therapy should be initiated in combination with periodic follow-up examinations and a thorough ophthalmologic evaluation for monitoring the progression of retinopathy for at least 18 to 24 months²⁵.

First step to control Diabetic Retinopathy is to manage the DM because persistent hyperglycemia is a major risk factor in development of DR. Tight glycemic

control resulted by the HbA_{1c} level not only reduces progression of DR but also its development (The Diabetes Control and Complications Trial Research Group, 1993; UK Prospective Diabetes Study (UKPDS) Group, 1998). Management of blood pressure can also reduce diabetes induced retinal complications^{44,45}. Formation of Retinal hard exudates in patients with retinopathy has also been reported by Hyperlipidemia, and some studies showed that lipid-lowering therapy may reduce hard exudates and microaneurisms^{46,47,49}. These treatments not only delay the development of DR but also slow the progression of retinal lesions into more severe forms.

Laser therapy:

Laser photocoagulation therapy is the ordinary practice of managing PDR⁵⁰⁻⁵². It reduces outer layers oxygen demand of the retina and helps to divert this adequate oxygen and nutrients to the inner retinal layers by changing the hemodynamics to the ischemic inner retina. This will reduce the vascular endothelial growth factor's (VEGF) hypoxia-mediated secretion and regression of neovascularization. But this laser treatment is not effective in some patients with PDR and DME and they continue to lose vision despite the prompt laser treatment²⁰. In some patients especially of diffuse CSME, the grid laser treatment is somewhat less effective and more variable in outcome²³.

Steroid injections:

Various types of drugs through various drug delivery systems are being tried in DR patients. These include: intravitreal steroid injections, intravitreal administration of anti-VEGF drugs, peribulbar steroid injections, and injection of sustained-release steroid and intravitreal implants? To treat the pathogenesis of DR for patients who are unresponsive to laser therapy the most common second-line treatment is given, which includes intravitreal steroids and intravitreal anti-VEGF therapy. Corticosteroids are also used in managing the DR, among them triamcinolone acetonide (TA) is more common⁴⁹. It can be administered by various routes, containing intravitreal depot injection, posterior subtenon injection, intravitreal implant and periocular injection. Its most common complication is that it raises intraocular pressure and forms cataract, less common complications are retinal detachment and Endophthalmitis. It has been reported that Intravitreal triamcinolone reduces the risk of these adverse events. Some clinical trials show that for the treatment of PDR and macular edema the combination of laser photocoagulation with intravitreal TA showed improved visual acuity and decreased central macular thickness when compared with laser photocoagulation alone⁵³⁻⁵⁵.

Anti-vascular endothelial growth factor therapy in DR:

In the management of DR the most commonly studied anti-VEGF molecules are: ranibizumab, pegaptanib, bevacizumab and VEGF Trap-eye⁵⁶.

Treatment with bevacizumab is most commonly used because it is less expensive, and an option for patients who are unable to undergo surgery or refuse surgery due to their general condition⁵⁷. It also helps to prevent or decrease PRP associated macular edema. A few days before the planned surgery, bevacizumab injection helps surgical removal of fibrovascular membranes, decrease intraoperative time, reduces intra-operative bleeding, and prevents re-bleeding⁵⁸⁻⁶⁰. After vitrectomy prolonged and recurrent vitreous hemorrhage is a common complication associated with vitrectomy for diabetic retinopathy with an incidence ranging from 12% to 63%^{57,61}. Use of intra-vitreous bevacizumab with or without supplementary endo photocoagulation at the end of surgery decreases the frequency of re-bleeding. Combination of intravitreally administered steroids and anti-VEGF drugs improves the therapeutic effects in DME patients who are unresponsive to laser therapy by improving visual acuity and reducing the macular thickness⁶².

Carbonic anhydrase to treat diabetic retinopathy:

Families of enzymes known as Carbonic anhydrases (CAs) are responsible for the quick conversion of carbon dioxide to bicarbonate and protons. The carbonic anhydrase inhibitors are used to lower intraocular pressure⁶³. CA inhibition reduces vascular leakage and macular edema caused by fluid retention in the retina due to vascular permeability^{64,65}.

Acetazolamide is given which inhibits carbonic anhydrase and decreases the rate of aqueous humor production. Various animal studies confirmed that fluid retention can be decreased by CA inhibitors acetazolamide^{66,67}. DR causes vasoconstriction which decreases blood flow, causes metabolic waste accumulation and hypoxia. A large number of studies demonstrate that CA inhibitors cause ocular vasodilation and improve retinal blood flow. Dorzolamide increases retinal vessel diameters on systemic administration. Hypoxia induces neovascularization and angiogenesis in DR⁶⁸. Oxygen tension elevation induced by CA inhibitors due to increase in oxygen supply dorzolamide causes dilatation of the central retinal vessels and the duration of this dilatation mimics that which causes rise in retinal oxygen tension⁶⁵. DR causes platelet aggregation which causes capillary occlusion and ischemia in the retina⁶⁹. CA inhibitors showed a decrease in the velocity of thrombin-stimulated platelet aggregation⁷⁰.

CONCLUSION

Diabetic retinopathy is a serious global public health problem that reduces the quality of life. In next 25 years throughout the world diabetic patients are predicted to become double who are at risk for developing vision loss from diabetes. In this review pathways involve in DR have been discussed, but the exact mechanism involve in progression is still uncertain. Retinal samples can't be taken from living humans that's why exact mechanism of DR can't be analyzed. Further studies are required to better evaluate the effect of various drug therapies to manage diabetic retinopathy and blindness cause by DR. Clinical trials have shown that Long term use of Insulin prevent the worsening of DR, and tight glycemic control delays its progression. For tight glycemic control accurate administration of insulin plays a pivotal role. If insulin is not properly administered its desired effect can't be achieved. It involves selection of correct insulin type, appropriate site to administer, knowledge of storage condition of insulin and formation of proper skin fold to administer it. Ophthalmologists and physicians both are performing their role to improve the vision affected with diabetes. Patients with DR have a great need of regular eye screening, tight glycemic control and normal blood pressure for prevention of diabetic retinopathy.

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CASE REPORT

Adenoid Cystic Carcinoma: Rare Presentation on Ventral Surface of Tongue

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ABSTRACT

Adenoid cystic carcinoma is a rare kind of tumour that can exist in any part of body. It most often occurs in the areas of head and neck comprising 2-4% of all head and neck malignancies and occurring as 10-12% of all malignant salivary gland neoplasms. Its occurrence in the head and neck is mostly detected in the major and minor glands of oral cavity, pharynx and paranasal sinus where it presents as a slow growing firm nodular swelling. The aim of the article is to highlight the unique presentation of adenoid cystic carcinoma as a cystic to firm swelling on ventral surface of tongue. Here we report a case of adenoid cystic carcinoma that was on ventral surface of tongue. Our patient 54 years old female Heera Bae presented to ENT and Head & Neck surgery department JPMC with complain of a swelling on under surface of tongue. Swellings were two in number when she reported to a doctor in a nearby hospital; one of them was removed and sent for H/P, where she was diagnosed as a case of ACC on ventral surface of tongue. Then they sent the patient to ENT and Head & Neck surgery department JPMC where we did WLE and Modified Radical Neck dissection of patient then the patient is sent for Radiation therapy, now the patient is on regular follow up and showing good post-operative progress. We have also carried out a brief literature review on subject.

Kew words: ACC, rare case, ventral surface of Tongue, treatment.

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خلاصہ

ایڈنوائڈ سیکل کارسینوما ایک شاذ و نادر پایا جانے والا کیٹنسر ہے جو کہ جسم کے کسی بھی حصہ میں پیدا ہو سکتا ہے۔ یہ زیادہ تر سر اور گردن کے حصے میں پیدا ہو سکتا ہے جہاں پر یہ ۲ سے ۴ فیصد کے تناسب میں پایا جاتا ہے ان حصوں میں یہ سلائینوری گلینڈ (Slivary gland) میں ۱۰ سے ۱۲ فیصد کے تناسب میں پایا جانے والا کیٹنسر ہے۔ سر اور درماغ کے حصوں میں منہ کے اندر، گلے اور پیئر ایسیل سائینس کے بڑے اور چھوٹے غدودوں میں پایا جاتا ہے جہاں یہ آہستہ آہستہ ایک گٹھی کی صورت میں بڑھتا ہے۔ اس مراسلہ کا مقصد اس کیٹنسر کی موجودگی زبان کی اندرونی سطح پر ہے جہاں اس کے پائے جانے کا تناسب بہت کم ہے، پر بیان کرتا ہے۔ یہاں ہم ایک ایسے مریض کا تذکرہ کریں گے جس کی زبان کی اندرونی سطح پر یہ کیٹنسر پایا گیا تھا۔ ہمارے مریض ۵۴ سالہ ہیرا بائی ہمارے ناک، کان، گلے کے وارڈ میں جناح پوسٹ گریجویٹ میڈیکل سینٹر میں تشریف لائیں۔ جہاں پر انکی زبان کے اندرونی حصہ میں ایک سو جن تھی۔ شروع میں یہ سو جن دو تھیں جن میں سے ایک حصہ کو ٹیسٹ کروانے بھیجا گیا جہاں اس مرض کی موجودگی کا انکشاف ہوا۔ جس کے بعد مریض ہمارے پاس ناک، کان، گلے کے وارڈ میں جناح ہسپتال میں بھیجا گیا۔ جہاں ہم نے اس مریض کے ترمیم شدہ گلے کی مکمل صفائی کی، اور زبان کے نیچے موجود سو جن کو زیادہ سے زیادہ نکال دیا تاکہ مرض کی موجودگی کا کوئی شبہ نہ رہے۔ اس کے بعد ہم نے مریض کو شعاعوں کے ذریعے سے علاج کرنے کے لئے بھیجا ہے۔ اب مریض ہمارے پاس آپریشن کے بعد معائنہ کے لئے رہی ہیں اور ان کی صحت بھی بحالی کی طرف جا رہی ہے۔ ہم نے اس مرض پر ایک مختصر تحقیق بھی کی ہے۔

INTRODUCTION

Adenoid cystic carcinoma (ACC) is relatively rare type of epithelial tumour of the salivary glands it is a malignant neoplasm that originates in both the minor and major salivary glands of head and neck, other sites of origin include the trachea, lacrimal gland, breast,

skin, and vulva. This neoplasm is defined by its distinctive histological appearance, characterized by slow growth, diffuse invasion via perineural space and potential to produce distant metastases, mainly to the lungs and bones¹. ACC accounts for approximately 2-4% of all Head & Neck carcinomas. They constitute 10-12% of all salivary gland neoplasm. Submandibular (S/M) gland being affected by percentage of 28% of all malignant S/M gland neoplasm, 5% of Parotid gland neoplasm and 30%-35% of all minor salivary gland neoplasms and in minor salivary glands it usually occurs in areas of palate. ACC progresses very slowly with wide perineural invasion into adjacent nerves, suggesting the release of strong neurotropsin from the tumour^{2,3}. Perineural invasion occurs through the

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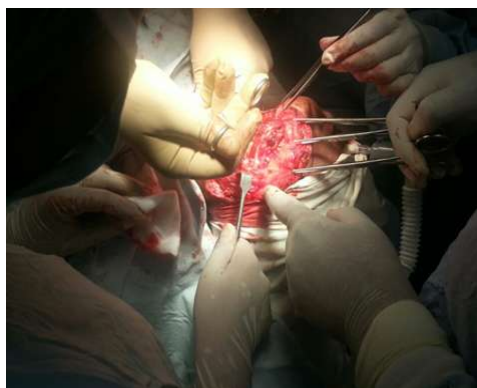
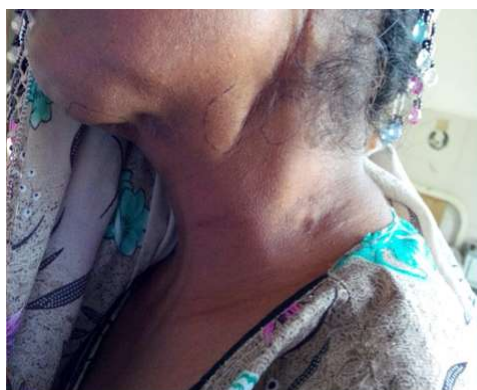
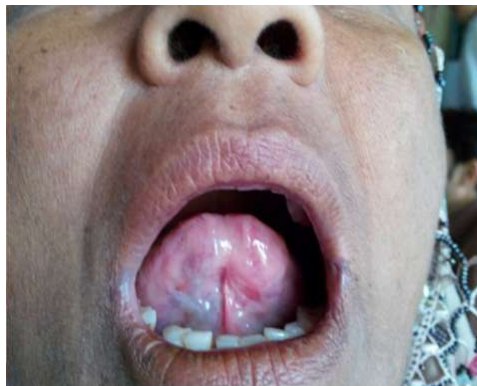
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perineural space or within nerve itself² Lymphatic spread is rare, however there may be incidents of hematogenous dissemination of tumour. Distant metastases can occur to the lungs, brain liver and bone⁴. Purpose of reporting this case is that nearly 8.8% of case are reported on the base of tongue and in tongue only 2.9% of cases occur with mobile tongue, otherwise mobility of tongue is usually impaired, so making it a very rare case presented with mobile tongue. Hence it is very essential to record the lesions from minor salivary glands, as on the tongue the incidence of their occurrence is very less when compared with other sites⁴.

CASE REPORT

A 54 years old female patient presented to ENT and Head & Neck surgery department JPMC, Karachi with complain of cystic swelling on ventral surface of tongue covering its ant 2/3rd not crossing the midline of tongue with a prolong history of about 10 years. The time when she reported to us hospital patient was having swellings on ventral surface of tongue, pain in swelling on ventral surface of tongue from 2 years and odynophagia and pain in the throat 1 year. Patient reported a long term tobacco chewing history, otherwise she was a healthy female with non significant past medical and surgical history. Intra oral examination revealed a swelling an ventral surface of tongue approximately 1.1 x 0.5 cm in dimension with normal and intact surface mucosa with no sinus and pus coming out no colour changes, Extra oral examination revealed lymph nodes palpable in neck from level I to level IV ipsilaterally, largest one being 2 cm in diameter at level II .Biopsy was carried out as swellings were two when she reported to some nereby hospital in Larkana, one of swelling sent for H/P and H/P features revealed fibromuscular tissue exhibiting infiltrating neoplastic lesion arranged in cribrifom acinor nests and cords, perinerural invasisn was also present and immunohistochemical stain showed it CD 117 positive all these H/P and immunohistochemical features were in favour of ACC so based on patient's history and clinical examination and Radiological investigations ACC was diagnosed and patient was treated in ENT & Head & Neck surgery department JPMC where her hemiglossectomy plus modified. Radical Neck dissection was carried out and then patient was sent for post surgical radiotherapy session. Now patient is on 3 months of post surgical F/U, showing good health and absence of clinically detected metastasis or local alteration.



DISCUSSION

Adenoid cystic CA was first described by Robin, Lorian and Laboulbene in 1853 and 1854, in their two articles. Then Billoroth in 1859 gave that tumour the name “cylindrome” based on its H/P appearance and Spies in 1930 gave the name “Adenoid cystic carcinoma” to this tumor in his session of discussion of cutaneous and non cutaneous tumours of basal cell types⁵.

WHO definition of ACC is, “A baseloid tumour consisting of epithelial and myoepithelial cells in various morphological configurations including tubular, cribriform and solid patterns. It has relentless course and, usually a fatal outcome”³.

Clinical course of ACC is slow growing, painless tumour, which keeps it silent for many year and delays its diagnosis. As in our case patient gave us a prolong history of 10-12 years. Early symptoms depend on the tumour’s location and may include lumps under the lining of the mouth or facial skin; numbness in the mouth or face; difficulty in swallowing, hoarseness, pain, and paralysis of a facial nerve. ACC often has long periods with no growth followed by growth spurts; however, it can be aggressive in some people⁷. ACC is more common in females with a ratio of 1.2:1 and peak incidence occurs in 5th – 6th decade of life, our case agrees with both of the above observations that it is seen in women population and age of patient was 54 years.

Histologically ACC has three different variables cribriform, tubular and solid, solid type shows the worst prognosis due to the presence of increased mitotic figure. Grading of ACC is also done on their H/P patterns i.e. Grade I Mostly tubular & some cribriform

pattern, Grade II >30% cribriform & tubular & <30% solid, Grade III >30% solid. Survival rate was less in solid pattern when compared with the cribriform and tubular pattern and in our case it was both tubular & cribriform pattern of ACC.

Only 2.9% of the cases have been reported in the minor salivary glands of mobile tongue, making our case a rare presentation with mobile tongue. The treatment is usually surgical excision of the tumor with adjuvant radiotherapy in patients with advanced T stage and/or positive surgical margins⁵. It increases the prognosis rate. Chemotherapy is having no role in ACC but when there is an evidence of distant metastasis chemotherapy can be avail as an option.

CONCLUSION

The primary treatment objective in adenoid cystic carcinoma patient is local control preservation of normal functionality and distant metastasis prevention. For this purpose, early detection by the surgeon is a requirement, in order to enable a more favourable prognosis and better quality of life. The surgery involving associated radiotherapy remains the modality of choice for most cases.

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Spontaneous Haemopneumothorax

Ashok Kumar, Nadeem Rizvi

ABSTRACT

Spontaneous haemopneumothorax is a rare clinical entity that complicates spontaneous pneumothorax and is at times considered a surgical emergency. Patients may present to the emergency department with signs of dyspnoea and severe hypovolemia due to accumulation of air in pleural cavity that further gets complicate when feeding blood vessels present in septas break up. Initial management consists of fluid resuscitation and drainage of the pleural space, and blood transfusion if required. Treatment consists of insertion of an intercostal tube and if required surgical intervention, by either video assisted thoracic surgery or open thoracotomy.È

Key words: Drainage; Video assisted thoracic surgery; Thoracoscopy.

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خلاصہ

نمونیا کی علامات کے ساتھ اچانک بلغم کے ساتھ خون کا اخراج ایک خطرناک علامت کی حیثیت رکھتا ہے۔ اور کبھی کبھی بروقت جراحی کا متقاضی ہوتا ہے۔ مریض سانس لینے میں سخت دقت محسوس کرتا ہے۔ اس لئے کہ سانس کی نالیوں میں خون کے بہاؤ اور انجماد کی وجہ سے پیچیدگیوں پیدا ہو جاتی ہیں فوری طور پر خون کے بہاؤ کو روکا جاتا ہے۔ اور خاص مائع کے ذریعے سانس کی نالیوں کی صفائی کی جاتی ہے۔ مگر اکثر جراحی کی ضرورت پیش آتی ہے۔

INTRODUCTION

Spontaneous haemopneumothorax (SHP) is an infrequently encountered cardiorespiratory catastrophe, complicating 1–12% of patients with spontaneous pneumothorax (SP)^{1,2}. It is defined as the accumulation of more than 400 ml of blood in the pleural cavity in association with spontaneous pneumothorax³. It is most common in the age range 20-40 years and its prevalence is higher in men than in women^{3,4}. The clinical features depend primarily on the amount of blood loss and air leakage. A sudden moderate chest pain, either at rest or on physical exertion, is characteristic³. It may be considered a surgical emergency as the patients suffering from this condition may present with significant dyspnoea and unexplained signs of drastic hypovolemia due to blood loss into the pleural space^{2,3}. As a result, these patients require early diagnosis and urgent treatment.

CASE PRESENTATION

A 29-year-old male was admitted through the Accident and Emergency Department of our institution with

complaints of shortness of breath and left-sided chest pain of two hours duration. There was no history of trauma. He was a non-smoker with no significant past medical history. He denied any medication or drug abuse and had no history of addiction.

Physical examination revealed a blood pressure of 110/80 mmHg and a pulse of 120 beats/minute. His respiratory rate was 36 breaths/minute and he was afebrile. His jugular venous pressure was not raised and he was not cyanosed. Chest examination revealed the trachea to be slightly shifted to the right side. There were decreased chest movements with resonant percussion note and absent breath sounds on the left side of the chest. A chest radiograph demonstrated a left-sided pneumothorax with air fluid level (Figure 1). Tube thoracostomy was done and the radiograph was repeated.

Bubbling was noted in the underwater seal. The patient's condition improved initially but after an hour a sudden gush of 800 ml haemorrhagic fluid was noted in the chest drain bottle (Figure 2). The haematocrit of the haemorrhagic fluid was compared to the patient's blood haematocrit and was found to be more than half the level of the blood haematocrit, proving that this was a spontaneous haemopneumothorax and not due to trauma in placing the chest drain. Subsequent course was unremarkable. After two days, the lung was fully expanded. The chest tube was removed. A CT scan chest was reported to be normal, with no bullae,

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subpleural blebs or tumour. Coagulation profile, serum electrolytes, renal function tests and liver function tests were within normal limits. The patient was discharged from the hospital within a week and has been doing well on follow-up visits.



Figure 1: Chest X-ray showing pneumothorax on the left side



Figure 2: Haemorrhagic fluid in the chest drain bottle

DISCUSSION

Three mechanisms of bleeding are described in spontaneous haemopneumothorax, either due to torn apical vascular adhesion between the parietal and visceral pleura^{2,5,6} or due to torn congenital aberrant vessels between the parietal pleura and the bulla as the lung collapses⁷ or as a result of rupture of vascularized bullae and underlying lung parenchyma⁷⁻⁹. There is limited angiographic evidence about the presence of bleeding aberrant vessels of different origin⁸. In order to differentiate between spontaneous haemopneumothorax and a blood-stained effusion, a patient's clinical history, physical examination, radiological evidence, air and blood aspiration, and haemoglobin determination in the aspirated blood are very useful diagnostic tools. In a stable patient, CT scan can be helpful to exclude neoplasia before elective surgery. Regarding the treatment policy, it should be based on the subject's condition as the clinical appearance of the disease is determined by the amount of blood loss and air leakage^{2,7,8}. Initial treatment is directed to cardiopulmonary stability, resuscitation and reexpansion of the lung. Appropriate fluid resuscitation and drainage of the pleural space must be commenced^{6,7}. Blood transfusions may be necessary^{2,7,9}. Indications for thoracotomy include hypovolemic shock, continuous bleeding, persistent air leak, impaired lung expansion, pachypleuritis, or recurrent pneumothorax⁹. However, tube thoracostomy is sufficient in cases when the above mentioned indications are not present. Video-assisted thoracoscopic surgery (VATS) has emerged as the gold standard in the management of many thoracopulmonary

problems, including spontaneous pneumothorax to access the bleeding point^{2,7,11}. It reduces surgical trauma and is associated with lower postoperative complications and shorter postoperative hospital stay compared with thoracostomy⁷⁻⁹. It can be used in elective surgery after initial resuscitation. A limited thoracotomy may be safe in cases of shock where major bleeding occurs and in chronic cases where fibrin has been organized forming firm adhesions and gel-like pseudomembranes. Few cases have been reported in favor of the conservative approach with chest drainage¹⁰. Despite initial transient haemodynamic instability, our patient became stable after transfusion of two pints of whole blood and there was not any further bleed. After 48 hours, it was observed that the patient's lung expanded fully without any complication and without any surgical intervention. It is highly unlikely that the haemorrhagic fluid was due to trauma of thoracostomy because the X-ray before procedure was showing air fluid level and the fluid was not being clotted.

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CASE REPORT

Propranolol in Rapidly Proliferating Hemangioma of Infancy with Complications

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ABSTRACT

Infantile hemangioma, commonly referred to as strawberry vascular tumor, is one of the commonest benign vascular tumors of the newborn. The management of this lesion remains under discussion and various protocols have been proposed. This tumor at some locations needs urgent attention. We report two cases of infantile hemangiomas involving eyelid and part of the face. One lead to closure of eyelid and other bled significantly on four occasions with ulceration of the lesion. Oral propranolol was used that showed remarkable change in the morphological features of the tumor with significant reduction in the size of the lesions.

Key words: Capillary hemangioma, infantile hemangioma, Propranolol.

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خلاصہ

Infantile hemangioma جو عام طور سے اسٹریبیری عروقی (Vascular) رسولی کہلاتی ہے نومولود بچوں میں ایک عام عروقی سومی (Benign) رسولی ہے۔ اس اعضاء کے خلل کے علاج کے بارے میں مختلف اراء اور طریقے پیش کئے گئے ہیں۔ کچھ جگہوں پر اس رسولی کے نکلنے پر خاص توجہ دی جاتی ہے۔ اس مضمون میں ہم دو Infantile hemangioma مریضوں کے بارے میں ذکر کریں گے۔ ایک بچے کے پپوٹے پر اور دوسرے بچے کے چہرے پر یہ رسولی موجود تھیں۔ اس کی وجہ سے ایک کی آنکھ بند ہو گئی تھی اور دوسرے کے چہرے پر چار موقوں پر خون نکل آیا تھا۔ Oral propranolol کا استعمال کیا گیا جس کی وجہ سے رسولی کے صرفی (Morphological) خصوصیات میں تبدیلی آئی اور اس اعضاء کے خلل کے پیمائش میں نمایاں کمی آئی۔

INTRODUCTION

Infantile hemangioma (IH) has been studied extensively and various features of the tumor have been brought into light. The natural course of this tumor is quite predictable with growing, stationary (stable) and involution phases that spread over many years. Various treatment protocols have been proposed including “wait and watch” approach. In some locations it requires special attention¹. Eye is one such anatomical locations. In infants vision is seriously impaired if eyelids remain closed. Tumor may bleed from ulceration which can be significant. We report two cases of hemangioma where eye was involved that demanded active management.

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CASE REPORTS

Case 1: A four month old male baby presented with extensive strawberry tumor involving most of the upper face mostly on right side including right eyelid. Baby was unable to open the eyelid for many weeks with watery discharge. There was no lesion noted at birth. It appeared as a small bright red spot but then grew at alarming rate and reached to present state in due course of time (Figure 1). The color of the lesion changed from bright red to little dark shade at some places. There were no other such lesions on the body.

Patient was admitted and investigated. His vital signs related respiratory and cardiovascular systems were monitored. Blood glucose level was also checked. Following investigations baby was put on oral propranolol 1mg/kg/day in three divided doses. Photographs of the patient were taken at three days interval and changes were compared. Within 72 hours after starting propranolol mother noted that tenseness of the lesion was no more apparent. On ensuing days



Fig 1: Hemangioma involving right side of the face including right eye



Fig 2: Four weeks post propranolol use: Eyelid can now be opened.



Fig 3: A large ulcerated bright red hemangioma encroaching eyelid.

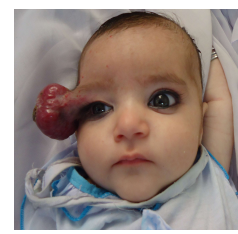


Fig 4: Seven weeks post propranolol use: Lesion has darker hue, becoming pedunculated with open eyelid.

change in color and size were noted. Within two weeks baby was able to open the right eye and in four weeks time baby could keep eyelid open all the times when awake (Figure 2). Patient was discharged after one month on same dose to be followed in outpatient department

Case 2: A six weeks old female baby presented with a table tennis ball size lesion over face at lateral canthus of right eye partially encroaching eyelid. The lesion was not present at birth. It appeared as multiple small red spot in the same area after two weeks which then coalesce and rapidly grew to present size. Lesion was protruding nearly 2 inch above the level of the skin. It has an ulcerated surface from which patient has bled on four occasion. Last episode was significant as large amount of blood was lost (Figure 3).

Patient was subjected to same protocol as described in case 1. The response of the patient to oral propranolol was slow. But it was noted after a week that there was gradually decrease in the tenseness of the lesion and ulcerated part appeared scaly and had dark hue. The lesion gradually softened and appeared more pedunculated with easy mobility in all directions which was not present earlier (Figure 4). Patient is on regular follow up and is receiving the same dose.

DISCUSSION

Propranolol in recent years has surfaced as a promising treatment of IH. Different mechanisms of actions have been proposed. With boost in stem cell research new aspects related to IH are reported. It is suggested that propranolol decreases blood flow into the lesion by vasoconstriction and induces apoptosis. It is believed that propranolol has other mechanisms of action including effect on vascular endothelial growth factors and inductions of adipogenesis². Genetic differences in response to propranolol have been reported. In a study from China this observation has been strengthened³. This is a potential area of research on this subject from our part of the world too.

Interestingly dose of propranolol is not agreed upon. We used lower dose and found response in our patients. One area of concern is re-growth of hemangioma when drug is stopped. Thus duration of treatment is not agreed upon. There are many potential complications associated with the use of this drug including respiratory and cardiovascular system changes, as it is a non selective beta blocker. Thus strict inclusion and exclusion criteria must be defined. In-hospital treatment is mandatory at the start to diligently observe the patients for any side effects on cardiac rate, rhythm and blood pressure, respiratory difficulty, hypoglycemia etc⁴. Same was followed in our patients. No such changes were observed so the drug was continued. Topical timolol, a beta blocker, has been in IH with success⁵. This is worth trying for small hemangiomas but may not be practical for large lesions as were present in our patients because dose is less and only few drops can be used for topical application. The drug is used in ophthalmology practice. Based upon our experience of two cases of IH with complications it is suggested that propranolol may be worth trying in such alarming lesions that threatens life and organ functions of a patient.

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