Molecular Classification of Cancer

Referral Patterns of Rheumatological Diseases Among Pediatricians

Health Care Seeking Behaviour of Migrant Labourers

Relationship Between Personality Type and Dental Caries
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Many papers have been published on the caution of generalizing the results from a sample study to the population. Many of the researchers who have some basic knowledge in the application of appropriate statistical methods for the analysis of their research data know the limitations of generalization of results from sample studies. However, since covering the whole defined population for the study is not feasible both financially and the limited time available, they all depend upon the sample selected randomly and interpret the results with a defined error. This is the minimum one can do in research unless the whole defined population is covered for the study. The well-defined p-value could be chosen as small as possible depending upon the time, the size of the sample and the funds available, stating what could be the error in providing a p-value (may be 0.05 or even lesser), indicating to what extent one will be wrong in generalizing the results and making conclusions and recommendations. But, as I had indicated earlier this is the maximum any researcher can do in arriving at valid conclusions acceptable scientifically. This does not mean that our research funds are wasted or wrong message is given to the researchers and the consumers. Simply blaming the well-developed and defined methodologies do not solve the problem. Yes, one has to convey the possible minimum error in making the conclusions. That is the way the research and statistical methods have been developed with scientific support.

However, I would like to use this opportunity in conveying very important message. The consumers, which includes not only the researchers, but also the common citizens-normal or having some disease should be warned in whatever possible ways that the decisions made on recommending a treatment is not 100% guaranteed and but, in the best possible way based on the results likelihood of positive results are very high, if not 100%. Simply conveying that coffee or chocolate is good for health one day and they are bad on another day is not research. This happens because the important and confounding variables are not considered in the statistical analysis.

Some years back while working in a medical college abroad I found that one of the student was very good and had got maximum marks, not only in Statistics, but also, in all the subjects. But, unfortunately he was a chain smoker. I wanted that he should stop smoking. When I asked him to stop smoking narrating that heavy and continuous smoking could cause lung cancer. He replied that his grand father started smoking from the age of 15 years and he, who is 70 years old, is healthy and not having lung cancer. It does clearly mean that all the smokers do not get lung cancer. But, the chance of getting cancer in smokers is several times more, may be 20 or 30 times, than a person who is not smoking.

Research results cannot be 100% positive and acceptable and applicable to the whole population. However caution is certainly worthwhile that the chance of getting lung cancer is comparatively very high compared to non-smokers. Examples are-in a clinical trial research if the new medicine proved to be significantly (statistically) better than the standard treatment the popular p-value (any value less than 0.05) has to be given indicating how much error is committed in arriving at that result. Similarly, when it is proved that there is no statistically significant difference in the cure rate between the standard & new treatment groups one has to take a caution by indicating whether the sample size in the study is adequate enough to arrive at that conclusion. The famous ‘Power’ of the test helps us in arriving at a valid conclusion. Power of the test should not be less than 80%. If the Power is more than or equal to 80%, one can accept the decision of no difference in the treatment effects between the standard & the new treatment. If the Power is less than 80%, sample size in the study is inadequate to take a statistically acceptable decision. Study should be done in an increased sample size. Without this the results have to be interpreted with caution indicating that sample size studied is inadequate to take a valid decision. This caution has to be indicated while taking a decision.

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Emotional Intelligence for Physicians

Rajesh Pai*

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There is a rising tide of physician burnout coupled with its effect on quality of care and makes burnout a major threat to healthcare system across the world. Burnout is a syndrome of depersonalisation, emotional exhaustion and sense of low personal accomplishment.

Pinning down the cause of the burnout is difficult because many personal and professional factors contribute. In a survey conducted in US, respondents rated increased clerical burden as the biggest cause. More than half of the respondents says increased productivity requirements /expectations contributes to burnout.

The healthcare industry as a whole must work together to alter the burnout trajectory for physicians before it worsens and further jeopardises patient care. Right now the burnout is treated as if there is something wrong with the physician rather than the system. The physician has lost stature as a team leader and is just another cog in the machine.

The solutions suggested for the burnout is multiple. One of them is to give performance training for physicians. During medical school, part of the training curriculum should be dedicated to learning and practising the fundamentals of human performance – sleep, physical activity, nutrition, mindful awareness energy management and self-compassion. These are the tenets of what is termed as ‘lifestyle’ or ‘preventive’ medicine. In addition to clinical mentors, trainees should have access to personal trainers, dieticians, sports psychologists and psycho-therapists to develop a personal performance plan. Physicians like business executives and Olympic athletes need coaches, drills and routines to stay at the top of their game.

Peer groups in which to trouble shoot, process emotions and practice leadership skills should be woven throughout medical education to provide social support and accountability. For example, the mind body medicine program in Georgetown University school of Medicine, medical students experiment with techniques like meditation, guided imagery and biofeedback to enhance self-awareness and stress management.

In the balance of life program at Stanford Medicine, surgical residents receive leadership training and practice team dynamics with a clinical psychologist. Such innovative programs could help pioneer the path forward. Indeed, common sense and research affirm that doctors who practice healthy behaviours provide better counselling and motivate their patients to adopt such health advice. Community and belonging are essential human needs. As the nature of our work evolves, professional and personal commitments are no longer mutually exclusive. Our workplace must reflect this. Then only can we regain joy in work.

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ABSTRACT

Haemophilia A and B are X linked recessive bleeding disorders which can lead to critical bleeding episodes, disability and poor quality of life. Early detection, prophylaxis treatment and comprehensive care are currently the standard of care in developed nations. On the contrary, developing nations are striving for early detection of persons with Haemophilia (PwH) and to provide comprehensive care for such individuals. Financial constraints in delivering the essential resources are the major barriers related to haemophilia care in low and middle income countries. A well structured, unified paediatric registry at regional level has the potential to significantly reduce the disability and mortality related to haemophilia in children. The proposed paediatric haemophilia registry for the state of Kerala will document demographic details of PwH, diagnostic modalities, treatment options /outcomes, quality of life and microeconomic impact of treatment expenses. The registry also intends to document and analyse the role of ultrasound based investigations (USS) in the early detection and management of joint damage. This will be done in a prospective cohort of children and adolescents with haemophilia who are on long term prophylaxis. The proposed registry appears to have the potential to accomplish comprehensive haemophilia care in resource poor settings.

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BACKGROUND

Haemophilia A & B are X linked recessive congenital bleeding disorders. They are caused by deficiency or complete absence of functional plasma clotting Factor VIII and IX respectively1,2. Joint bleed is the hallmark of haemophilia. Life threatening haemorrhages leads to haemophilic arthropathy, disability and reduced quality of life3. Haemophilia is treated by replacing the protein that is missing in the blood4.

Haemophilia treatment strategies are On Demand Treatment (ODT) and Prophylactic Treatment (PT)5. Various studies have proven that patients on PT have less haemorrhagic episodes, fewer progressive joint deterioration, reduced hospitalization and limited days lost from work or school compared to ODT. The results of the Swedish1,7-12 and of subsequent studies10,11,12,13 reported the clinical and social benefits of different prophylaxis regimens.

The outcomes assessed in these studies were frequency of total and joint bleeds, arthropathy (assessed by clinical and radiologic scores) and Quality Of Life (QOL) of patients with haemophilia.

Patients on PT reported reduction in frequency of total and joint bleeds, lesser prevalence of arthropathy and better QOL. They also documented better results for patient joint status on early initiation of prophylaxis as measured by Haemophilia Joint HealthScore (HUHS), Functional Independent Score for Haemophilia (FISH) and Petterson scores.

These reports formulated the current definitions of prophylaxis14,15 which is based on the prevention of joint abnormalities to enable normal life and psychosocial development for haemophilic children. It has been estimated that 70–80% of people with haemophilia across the globe and those living primarily in the developing world, receive inadequate or no treatment16. This is probably because of the unavailability and/or unaffordability of factor concentrates17. Costs of clotting factor concentrate remains the major barrier in the uptake of prophylaxis regimen for Haemophilia in developing countries18.

A previously published Cochrane review (2005) highlighted the lack of randomized controlled trials in comparing PT and ODT for haemophilic children19. This issue was addressed by two studies that followed the review. The two studies were conducted using recombinant factor VIII (rFVIII). The Joint Outcome Study (JOS, n=65, age <30 months) was the first trial to be published. This was a prospective, two arm parallel, randomized trial20. Children on PT were administered with rFVIII 25 IU/Kg every other day a week. Children on ODT received 40 IU/Kg at the time of joint haemorrhage and20 IU/Kg at 24 hours and 72 hours after the first dose. The primary endpoint of the study was the prevention of joint deterioration. Prophylaxis was started prior to or at the time of the second joint bleed. All enrolled children were subjected to joint assessment at the age of six years by radiography and/or by Magnetic resonance imaging (MRI)21. As per MRI findings related to the six index joints at six years of age, 93% in the PT group and 55% in the ODT group (P = 0.002) reported normal joints. The PT group reported 83% reduction in the risk of joint damage compared to ODT group (RR 0.17).

The ESPRIT trial (Evaluation Study on Prophylaxis: a Randomized Italian Trial)22, recruited 40 patients of age 1-7 years for PT. All of the recruited children were nega-
joint bleeds as well as consequent joint damages in children with severe haemophilia. The trial concluded that low-dose FVIII prophylaxis (20-40 IU/Kg in two divided doses/week) in children with severe Haemophilia. The results of this trial reported significant reduction in hemarthroses (0.20 v/s. 0.52 events/patient/month, P < 0.02) and lower haemarthropathy as per Petterson scores (29% v/s 74%, P < 0.05) among children on PT arm compared to those in ODT arm.

The results of the two trials (JOS and ESPRIT) provided evidence based guidance for recommending prophylaxis as the treatment of choice in haemophilic children. This treatment was jointly endorsed by the World Health Organization (WHO) and the World Federation of Haemophilia in 1994.

The current recommendation is that prophylaxis should be continued indefinitely and should be the treatment of choice for persons with haemophilia at any age. A recent randomized trial was conducted in India on very low dose factor VIII prophylaxis (10 units/kg body weight on 2 days a week vs Episodic group receiving factor concentrate in standard recommended doses) in children of 1–10 years of age with severe haemophilia. The trial concluded that low-dose FVIII prophylaxis is cost effective, efficacious and safe in preventing joint bleeds as well as consequent joint damages in the Indian setting.

Recently a clinical audit was done by our institution relating to low dose prophylaxis (20-40 IU/Kg in two divided doses/week) in children with severe Haemophilia. The results of this audit reported significant clinical benefits with low dose prophylaxis period compared to On Demand Treatment period.

Being a lower middle income country, India is unable to provide free prophylaxis for all persons with haemophilia. Currently state governments and Haemophilia federation of India provide plasma derived clotting factors VIII and IX free of cost for On Demand Therapy in some states including Kerala. The availability of clotting factors free of cost for prophylaxis is a great challenge in the Indian context. Many persons with haemophilia are deprived of prophylactic treatment due to the constraints in availability and affordability of clotting factors. There is limited data regarding long-term treatment effects of continuous low dose prophylaxis in children as well as in adults with Haemophilia from India. The proposed initiative is an attempt to set up a clinical registry in regional level to document the diagnostic profile, treatment outcomes, quality of life, and micro economic impact of treatment and rehabilitation of children with Haemophilia under long term prophylaxis. Regional clinical registries are the vital documents to interpret the existing information regarding a disease documented in an area, to find the lacunae in the ongoing system and to establish proper methods to acquire the needed outcomes.

Summary of current evidence

Haemarthrosis is diagnosed with clinical findings of pain and reduced mobility. It is diagnosed accurately with MRI. MRI is accepted as the gold standard for diagnosing joint bleeds and associated changes due to haemophilia. The challenges in the routine use of MRI are availability, time requirements, affordability and need for sedation in small children. Several scoring systems are available to determine haemophilic arthropathy with respect to clinical findings as well as radiological findings. These systems are insufficient to detect early joint changes which has an overall impact in initiation of treatment and other aspects like physiotherapy support, morbidity burden and quality of life. Ultrasound is supposed to be a fast, simple, low cost and effective method to find out early changes in joints thus leading to proper management of the disease. A prospective cohort study was conducted in Spain to compare the diagnostic accuracy of ultrasound examination with MRI in diagnosing joint problems in persons with Haemophilia. A total of 30 patients with severe disease were evaluated with both modalities. The study showed excellent agreement for observed bleeding (Kappa=1.0) between MRI and USS. Another prospective cohort study (n=20, mean age 22 yrs.) was done in Italy to compare USS to MRI in detecting joint changes in asymptomatic patients with severe haemophilia. Joint effusion, synovial hypertrophy and cartilage erosions were evaluated using MRI and USS scores. There was significant correlation with MRI and USS findings for effusion (r = 0.819, P = 0.002), synovial hypertrophy (r = 0.633, P = 0.036) and cartilage erosion (r = 0.734, P = 0.010). These findings suggest the utility of USS in detecting early onset of joint alterations. The diagnostic accuracy of USS for assessment of Haemophilic arthropathy was compared with MRI by Doria et al. Ultrasound was highly sensitive (> 92%) for assessing synovial hypertrophy and hemosiderin in both ankles and knees. USS had borderline sensitivity for detecting small amounts of fluid in ankles (70%) in contrast to knees (93%). USS had variable sensitivity for evaluating osteochondral abnormalities (sensitivity, 86–100% for ankles and 12–100% for knees) as per the study. The results suggest that USS is sensitive in detecting joint changes when the procedures are done by experienced radiologists.

Novelty of proposed registry

Studies showing good agreement between USS and MRI, in detecting acute joint bleeds and joint damage assessment in adults and children, with haemophilia are available. Studies comparing treatment outcomes in patients assessed with clinical findings as well as radiological findings (x ray and USS) are yet to be done from this country. Current clinical practice guidelines do not include USS as one of the key investigations to be done in persons with haemophilia for haemarthrosis and joint health monitoring. This is despite the fact that...
benefits of USS in the diagnosis and management of haemarthrosis is well established. The proposed registry intends to document and analyse the role of USS in the detection and management of joint damage detection in a prospective cohort of children and adolescents with haemophilia on long term prophylaxis.

CONCLUSION

Data regarding clinical outcomes after continuous primary/secondary/tertiary prophylaxis in children and adolescents on a long term basis is not available from our country. A locally designed registry that aims to capture demographic details of subjects, clinical details, diagnostic modalities, treatment outcomes, quality of life, microeconomic impact of treatment expenses and rehabilitation from children and adolescents with Haemophilia on prophylaxis appears relevant in the current context.

REFERENCES

22. 23.
23. 24.
24. 25.
26. 27.
27. 28.
28. 29.


31. Use of Ultrasound to diagnose haemarthrosis and monitor joint health in Haemophilia. MED document, March 2016. www.ohsu.edu/policycenter

32. Khan et al Cost-effectiveness analysis of different imaging strategies for diagnosis of haemophilic arthropathy Haemophilia (2010), 16, 322–32


Pan - Cancer Atlas: Comprehensive And Integrative Molecular Classification of Cancer
Prasanth Ariyannur*

**INTRODUCTION**

In the recent issue of Cell magazine, and its subsidiary journals Cell reports, Cell systems, Cancer Cell and Immunity, comprehensive information regarding molecular derangements in 33 major types of cancer was described named as the Pan-Cancer Atlas. It is an elaborate screening of a massive 11,000 tumor samples providing an in-depth interconnected understanding of why and how certain tumors arise in humans. As a confluence point, Pan-Cancer Atlas is considered an essential source for the development of new treatments and in the pursuit of precision medicine. This was made possible by the remarkable coordinated work of a massive group of cancer researchers across the world called The Cancer Genome Atlas consortium (TCGA). TCGA was started as a pilot project in 2006 headed by The United States National Institute of Health (NIH) via its subsidiaries such as National Cancer Institute (NCI) and National Human Genome Research Institute (NHGRI), with three essential goals: to better understand the molecular underpinnings of cancer, to derive molecular taxonomies and to identify novel therapeutic targets. With the compilation of whole genome project in 2003 by NHGRI and the advancement of DNA sequencing and identification of genetic variations at the genomic level, scientists were forced to “team-up” to better understand biological variations and pathophysiology of various cancers, which resulted in TCGA. To put that scientific interest in perspective, when TCGA project was started, the cost of sequencing one whole genome using Next Generation Sequencing (NGS) was $14 million (~ ₹92 crores) which has now reduced to $1000 (~ ₹70,000).

In the initial Pan-Cancer Atlas published in 2014, TCGA provided data from 3527 tumor samples comprising of 12 different major cancer types, analyzing somatic DNA (using exome sequencing, DNA methylation and copy number variation assessment), RNA (using mRNA and microRNA sequencing) and selected proteins and phosphoproteins\(^1\).

By integration and clustering of this information at different levels, various cancers were given a paradigm shifting molecular based taxonomy beyond any phenotypic contributions from tissue of origin to tumor stage. This emerged as a disruptive information stream to the prevailing histopathology-based classification. Following this initial TCGA classification and recommendation, a large number of new diagnostic and prognostic milestones were laid in the guidelines of oncology clinical practice after a series of individual and meta-analytical clinical correlative studies. This led to the introduction of new molecular diagnostic tests in routine clinical practice. More importantly, a growing number of novel therapeutic drug targets based on the TCGA data have entered into preclinical, translational studies and emerged as FDA approved targeted drugs in routine clinical practice following their highly successful clinical and therapeutic benefits. This shows that TCGA Pan-Cancer Atlas has provided a great deal of advancement in the understanding of cancer biology as well as cancer care. TCGA classification has now been adopted for colorectal adenocarcinoma\(^2\), endometrial cancers\(^3\), prostate cancer\(^4\), to name a few. To summarize the whole TCGA project is a daunting task considering the depth and vastness of the information it provides. In view of the importance of this information which could be deterministic in the science of the cancer biology and thereby cancer management and treatment for the next decade or so, it might be worthwhile to discuss some of the aspects of the project due to the following reasons:

1. This is an attempt to make many clinicians and cancer researchers aware of the existence of such a treasure of information which could be tapped into.

2. Clinical cancer specialists, who are motivated beyond publishing a journal report, may be able to plan what research or application of information needs to be done which would be critical in cancer treatment.

3. Basic science researchers who are interested in cancer biology and want to do an in-depth study, beyond superficial mutation association studies, should be able to utilize this information and expand the current information on cancer pathophysiology.

4. Novel central biologically driven therapeutic approaches can be explored, studied and applied, beyond the implementation of subsidiary and scaffold engineered exogenous agents to assist targeting and delivery, by highly motivated researchers.

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The current Pan-Cancer Atlas is an updated version with a vastly elaborate multi-platform integration and clustering analyses. The whole data has been divided into three different categories: Cell-of-origin patterns, Oncogenic processes, and Oncogenic signaling pathways. In the cell-of-origin pattern, the atlas reclassifies human tumor types to cell-of-origin (in terms of signals and markers) that influences but not completely determines tumor classification. In oncogenic processes category, the atlas gives an overall view of cancer induction and evolution by analyzing the collaboration of germline and somatic gene variations, mutations in cell signaling and immune cell composition. The oncogenic signaling pathway category deals with the comprehensive analysis of tumor signaling pathways, its vulnerabilities and future development of customized therapies. Pathways studied include MYC, RAS, Ubiquitin, DNA mismatch repair, splicing, and metabolism.

Cell-of-origin patterns dominate molecular classification, but not deterministic.

From the integrative molecular clustering analysis of 10,000 tumor tissue specimens of 33 different cancer types based on data obtained from chromosomal aneuploidy, DNA methylation patterns, mRNA, miRNA expression levels, the influence of origin of cell type was evident5. These similarities presented a focused pan-cancer analysis of each tissue type such as pan-gastrointestinal, pan-gynecological, pan-kidney, pan-squamous cancers and cancers that are related to each other by the “stemness” feature. Stemness feature is the mRNA/miRNA/DNA methylation profile which is compared against that of the stem cells or cells-of-origin of those tissue types. Though anatomically homogenous in clustering analysis, the immune infiltration and degrees of stemness were all variable, attesting to their molecular heterogeneity. For e.g. the three clusters of GI based on stemness (pan-GI cohort) consists of

1. A hypermethylated Epstein-Barr Virus associated stomach adenocarcinoma (STAD) tumors (C1:STAD)
2. A group of tumors with mostly microsatellite instability (MSI) STAD and colon adenocarcinoma (COAD) called C18-pan-GI (MSI), and
3. A group consists of COAD and rectal adenocarcinoma (READ) with chromosomal instability (CIN) and specific aneuploidy (C4:Pan-GI (CRC)).

However in pathway characteristics, which consisted of about 19,000 pathway features, as well as expression based scores and 18 canonical targetable pathways, these 3 clusters, differed in immune cell infiltration related signaling, which was high in C1:STAD (EBV-CIMP), C18:pan-GI (MSI) but not in C4: pan-GI (CRC) and C20: mixed (stromal/immune) that contained 32% pan-GI samples. In the C4:pan-GI (CRC), β-catenin/cell-cell adhesion signaling was higher than the other two. This was in line with the previous TCGA classification and studies except for the EBV subtype.

About two-third of the clusters fell into mixed (stromal/immune) group, showing various levels of heterogeneity. The most diverse cluster C20: mixed (stromal/immune), contained 25 tumor types. This shows that even though cluster groupings suggest tissue origin, a major part of it is not associated with immune infiltration and stromal characteristics which are more deterministic than the origin. Along this line, an important finding in this study is that cancers that fall under the two clusters C3: mesenchymal (immune) and C20: mixed (stromal/immune) tumors also collate gene programs representing PD1, CTLA4, GP2-T cell/B-cell activation indicating new immunotherapy may be considered. This warrants an additional molecular characterization of almost all the tumor samples, as they are currently being screened according to their anatomical site and stemness features. As the heterogeneity of the tumor samples is being explained in terms of cell-of-origin features, stemness variability features, stromal and immune cell infiltration features, oncogenic signaling variability features etc., these would be very critical in developing new modalities of cancer treatment such as basket or umbrella trials. Additional details on the pan-GI (6), pan-gyn 7, pan-squamous 8 and pan-kidney 9 can be obtained from their respective studies.

Oncogenic processes at the dawn of cancer genomics

In this section of the Pan-Cancer Atlas, three facets of cancer processes were analyzed.

1. Interactions of somatic driver mutations and germline pathogenic variants
2. Links across tumor genome and epigenome on the transcriptome and proteome
3. Tumor microenvironment interactions in terms of targetable driver events for immunotherapies

Though these three processes were analyzed, there were various other correlations and connections that were studied by certain core groups called Analysis Working Groups (AWG), who presented some of their analyses in current PanCan Atlas AWG studies. Aneuploidy AWG presented a comprehensive quantification of aneuploidy correlated with genomic features such as TP53 status, mutational load and lymphocytic infiltrate 11. Somatic dataset identified 3400 oncogenic mutations and 299 driver gene 12, > 800 pathogenic or likely pathogenic germline variants in 99 predisposition genes in about 8% of all cases 13. The study used eight molecular processes (see figure 1).
Of these eight, variants involved in the genomic integrity were found to have much higher cancer predisposition in germline (63%) as compared to somatic (14%). Remaining somatic alterations were largely involved in cell cycle, epigenetic modifiers, metabolism, oncogenic signaling, and transcriptional/translational regulation. Majority of the predisposition genes affecting genomic integrity belonged to the DNA damage response genes (DDR). This includes well-known genes such as BRCA1, BRCA2, CHEK2, ATM, BRIP1, PALB2, and PMS2. Additional information regarding the association of mismatch repair genes and microsatellite instability associated with markers of lymphocyte infiltration, germline-somatic variants behaving differentially in BRCA1 in breast cancer types have been described. Similarly, transcriptomal changes were associated with the type of cell-of-origin and the driver gene mutation. The overall comparative analysis of somatic mutation and transcriptomal changes showed upregulation of cancer driver genes by missense mutations and downregulation by nonsense and frameshift mutations. This has claimed to show the cis- effect of the mutated driver genes and trans- effect of gain-of-function frameshift mutation resulting in increased level of mRNA of certain genes (e.g. GATA3 in breast cancer). Interactions between different molecular levels such as methylomic, transcriptomic (mRNA) and proteomic (using reverse-phase protein array or RPPA) profiles created 58 cluster identities, with ≥ 20 samples per cluster. Tumor microenvironment, impact of driver mutations and mutation burden on the immune communication network were identified. Generally, RAS genes and BRAF V600 are the most frequently predicted antigens in cancers that directly steer immune response\textsuperscript{13}.

BRAF- driven mutations were found to have a higher level of CD8-T cells compared to NRAS driven tumors.

In short, this series provided a preliminary view of the complex interactions and environment of oncogenic process by integrating an enormous amount of data obtained from various TCGA themes. Germline genomic changes have wide-ranging pathway dependent influences on the somatic landscape. Certain oncogenic processes that are deregulated in certain cancer types are regulated by specific genes rather than prominent drivers. Findings suggest that a combination of driver mutations, cell types and cytokines might be used as a basis for basket immunomodulatory therapies. It is also evident that the cancer biology has evolved to understand tumor in terms of its larger environmental context. The findings described in this massive dataset...
suggest a drastic change in clinical practice and drug development. In the coming years, molecular biology based treatments in cancer will be developed from various AWG data set from a multi-omics approach (such as TCGA and Human Tumor Atlas Network-HTAN-) with the help of an optimized treatment plan designed from systematic bioinformatics analysis in terms of dosage, efficiency, side effects etc.

Signaling pathways
An understanding of the complex network of signaling pathways that are somatically altered and interplayed in different combinations in a variety of cancers across various organs is essential for the prognosis and development of novel therapeutic drugs. Out of the TCGA dataset of >9000 samples from 33 different cancer types, an integrated analysis of 10 signaling pathways showed a significant representation of individual and co-occurring alterations in these pathways.

10 canonical pathways (see figure 2) were selected and determined according to the previously detected key cancer genes, driver mutations, and therapeutic targets.

The TCGA atlas included data from somatic mutation (whole-exome sequencing), gene expression levels (RNA-seq), DNA copy-number alterations (Affymetrix SNP6 arrays) and DNA methylation (infinium arrays) information from the above mentioned tissue samples. After stratification of the genomic data from TCGA into 64 cancer types, which is available in cBioportal (http://www.cbioportal.org/) a set of genes were selected from the 10 canonical pathways from multiple previous TCGA analysis studies and publically available curated pathway tools. The genes were based on several of these analyses (www.PathwayMapper.org) on the activating (oncogenic) or inactivating (tumor suppressor gene) effects across different stratified sets and correlated using multidimensional statistical analysis. The functional variants were compared against a previously obtained knowledge database (OncoKB) along with several algorithms.

A curated pathway template was built, from which a list of genetic alterations was compared and correlated to their co-occurrence, mutual exclusivity, and potential therapeutic implications.

Among the different pathways, Receptor Tyrosine Kinase (RTK)-RAS-MAPKinase (RTK-RAS) pathway had the highest frequency of alterations (46%), followed by cell cycle, PI3K, p53, Notch, Wnt, Myc, Hippo, TGFβ and the least was from the Nrf2 pathway (1%). Among the different tumor types, MSI-H and polymerase-ε (POLE) mutant subtypes of gastro-intestinal and uterine cancers had the highest mutational burden. RTK-RAS signaling pathways was commonly altered in low grade glioma (LGG) of IDH-wt, lung adenocarcinoma, Thyroid Ca, Her2-enriched Breast Ca and melanoma. PI3K pathway alterations were found to be high in EBV-positive esophagogastric cancer, non-hypermutated (MSS) uterine cancer, and lung squamous cell cancer. Alterations of Wnt pathway was almost exclusively seen in colorectal cancer, and IDH-wt codeleted LGG. Among the RTK-RAS pathway, KRAS had the highest occurrence, followed by BRAF and EGFR. BRAF mutations were predominantly seen in melanoma and thyroid cancers.

In certain pathways, alterations were found to be involved in many genes (cell cycle, PI3K), while in others they are not (Wnt, Myc, Nrf2). Detailed alterations on RTK-RAS and PI3K can be obtained from corresponding study references. Among the 410 pathway alterations identified, 156 pairs were mutually exclusive and 117 were co-occurring alterations [see table S5 of 15].
Overall, Cell-cycle, p53, RAS, PI3K pathways had many mutually exclusive alterations, perhaps suggesting the importance of individual signal in switching on/off of the pathway, while others such as Wnt, RTK, Hippo pathway had many co-occurring signal alterations suggesting their synergistic effect. Many p53 and cell-cycle regulator pathways were co-altered suggesting that these pathways were invariably involved in many independent pathways (such as TP53 or RB1 mutations) or that a single alteration may have an effect on both pathways (e.g. CDKN2A deletion). Significant mutual exclusivity was found in the RTK-RAS pathway. EGFR activation was mutually exclusive with activation of ERBB2, KRAS, BRAF, and NF1. Strong co-occurrence was found with Nrf2 and PI3K pathways in lung, GI and uterine cancers.

In general, about 51% of the tumors had at least one actionable alteration in 10 signaling pathways and in 57% of the tumors these changes occurred when genes included were not involved in the selected signaling pathways. The highest among these was with melanoma (most of those actionable are standard of care now) and the least was testicular non-seminoma, mesothelioma, renal cell cancers, which had very low frequencies of actionable alterations (most of which are still investigational). Predictably, MSI-H and POLE mutated colon cancer and uterine samples had high frequency of targetable alterations. Interestingly those which have multiple targetable alterations can be considered for combination drugs (basket trials), for e.g. HER 2 & PI3K pathway inhibitors may be investigated in Her 2 - enriched breast cancer, uterine carcinosarcoma, CIN high endometrioid cancer. A detailed version of the various possible combinations can be obtained from figure 7D of 15.

Many alterations and tumor types are not covered in the current TCGA project, especially hematologic cancers. Notwithstanding the large tumor sample size, the effort is still under-powered to effectively discover tumor type specific alterations. Additional data such as metabolite levels, epigenetic states, post-translational changes, post-treatment and metastatic alterations, as well as the wider range of genomic and sub-genomic alterations in somatic variations, need to be studied as well. But as the TCGA project concludes, this would definitely form a strong platform for elaborate studies on the entire biology in the future. The pathway-level analysis for which the analysis pipelines laid out for templates and their curation is a strong and solid starting point.

REFERENCES

Awareness And Referral Patterns of Rheumatological Diseases Among Pediatricians in India
Mahesh Janarthanan*, Suma Balan**

ABSTRACT

Objectives: To study the awareness of rheumatological illnesses among pediatricians and to analyse their referral patterns of children with these conditions to specialists.

Methods: A survey in the form of a questionnaire was either emailed or sent to pediatricians in all states of India by whatsapp or email. Analysis of the survey was performed.

Results: 590 pediatricians from all over India completed the survey. Juvenile idiopathic arthritis (JIA), Kawasaki disease (KD) and Henoch Schonlein purpura (HSP) were the rheumatologic conditions seen most frequently in their practice. Pediatricians managed patients with acute rheumatic fever (ARF), HSP and KD by themselves. They are more likely to refer patients with systemic lupus erythematosus (SLE), JIA and vasculitis to specialists. 80% of pediatricians mentioned that they referred patients with rheumatologic conditions. 66.4% of pediatricians referred patients to either a pediatric rheumatologist or a pediatrician with interest in pediatric rheumatology and the rest to adult physicians. Chronic arthritis and unexplained chronic inflammation were the common non-specific reasons for referral to a specialist.

Conclusion: Pediatricians came across rheumatologic conditions in their practice quite commonly. About 52% of survey responders had access to refer patients to pediatric rheumatologists.

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INTRODUCTION

Based on 2017 census data showing Indian population of 1.34 billion and worldwide prevalence of rheumatic diseases in childhood the guess estimates are that there could be more than 1.3 million children with JIA and about 200,000 with lupus1,2. Unfortunately published data regarding prevalence of these diseases in India is lacking. For a country with such a huge patient load there are very few centres offering specialist care. In India there are about only about 12 centres offering pediatric rheumatology services and 2 training programmes for doctors aspiring to train in this speciality3,4. The aim of the study was to highlight this gap in health services and the need for developing pediatric rheumatology services in many underserved parts of the country.

METHODS

A questionnaire designed on google forms was either emailed or circulated via social media to pediatricians all over the country. No incentives were given for taking part in the survey. Survey was posted in state level pediatric groups by the members of Indian national pediatric rheumatology society and state level members of Indian academy of pediatrics. The questionnaire included queries on the age group to which they belonged < 30 years, 30-40 years, 40 -50 years & > 50 years, the sex of the responder, how long they have been in practice < 5 years, 5-10 years, 10 -2 0 years & > 20 years. There were also queries regarding practice setting and the options were teaching hospital, district hospital, private practice and running own nursing home. The responders were asked to choose their state of practice from a dropdown menu and to answer whether they referred pediatric rheumatology patients or not. The next query was whether they had encountered any of JIA, HSP, KD, SLE, ARF, juvenile dermatomyositis (JDM) or other vasculitis at least once in their practice and whether they would treat, refer or sometimes refer to specialists. The responders were also asked to specify the type of rheumatology services that was accessible to them and the options were pediatric rheumatologist, adult rheumatologist, pediatrician with interest in rheumatology, adult physician with interest in rheumatology or any other. The last query was the type of nonspecific chronic problems which they would refer and the options were nonspecific chronic joint pain, chronic arthritis and pyrexia of unknown origin, skin and joint symptoms, unexplained persistent inflammation, patient with obvious diagnosis eg malar rash and antinuclear antibody (ANA) or rheumatoid factor (RF positivity) in a patient. The survey responders were allowed the option of choosing more than one answer for this query.

RESULTS

Of 590 responders 110(18.6%) were under 30 years of age, 222(37.6%) in the 30-40 age group,138 in the 40-50(23.4%) group and 120(20.3%) over 50 age group.373 of 589 (63.2% )were male and 217(36.8%) were female. 178(30.1%) had been in practice less than 5 years, 129(21.9%) had been in practice between 5 to 10 years, 10 -2 0 years & > 20 years. There were also queries regarding practice setting and the options were teaching hospital; district hospital, private practice and running own nursing home. The responders were asked to choose their state of practice from a dropdown menu and to answer whether they referred pediatric rheumatology patients or not. The next query was whether they had encountered any of JIA, HSP, KD, SLE, ARF, juvenile dermatomyositis (JDM) or other vasculitis at least once in their practice and whether they would treat, refer or sometimes refer to specialists. The responders were also asked to specify the type of rheumatology services that was accessible to them and the options were pediatric rheumatologist, adult rheumatologist, pediatrician with interest in rheumatology, adult physician with interest in rheumatology or any other. The last query was the type of nonspecific chronic problems which they would refer and the options were nonspecific chronic joint pain, chronic arthritis and pyrexia of unknown origin, skin and joint symptoms, unexplained persistent inflammation, patient with obvious diagnosis eg malar rash and antinuclear antibody (ANA) or rheumatoid factor (RF positivity) in a patient. The survey responders were allowed the option of choosing more than one answer for this query.
working in a teaching hospital 246(41.7%), followed by 46(7.8%) responders each in district hospital and having own nursing home group.

State wise analysis of survey responders revealed the maximum responses from Tamilnadu followed by Kerala, Karnataka and Maharasthra. We received 149(25.3%) responses from Tamilnadu, 78(13.2%) from Kerala, 67(11.4%) from Karnataka, 54(9.2%) from Maharasthra, 40(6.8%) from Andhra Pradesh, 34(5.8%) from Assam, 27(4.6%) from Gujarat, 21(3.6%) from West Bengal, 20(3.4%) from Telangana, 14(2.4%) each from Chattisgarh and Goa, 10(1.7%) from Delhi, 8(1.4%) from Uttar Pradesh, 7(1.2%) from Rajasthan, 6(1%) each from Orissa and Jharkhand, 5(0.8%) each from Nagaland, Madhya Pradesh, Himachal Pradesh and Bihar, 3(0.5%) each from Jammu & Kashmir, Haryana, Chandigarh and Uttarakhand, 2(0.3%) from Meghalaya.

474(80.3%) responders referred pediatric patients with rheumatologic conditions, 50(8.5%) managed patients themselves and 66(11.2%) mentioned that they do not refer because they do not have access to pediatric rheumatology services.

When asked regarding rheumatologic condition encountered at least once in their practice 426 responders mentioned JIA, followed by KD (411), HSP (403), SLE (386), ARF (355), other vasculitis (324) and JDM (226). Of the rheumatologic conditions not seen in their practice, 283 respondents mentioned JDM, followed by other vasculitis (167), SLE (127), ARF (116), Kawasaki (76), JIA (85) and HSP (75).

99 responders mentioned that they would treat JIA themselves, 153 refer patients and 66 refer sometimes. 237 responders mentioned they treat HSP themselves, 52 referred and 49 sometimes referred. 202 practitioners treated KD themselves, 77 refer and 58 sometimes refer patients. 183 practitioners referred SLE patients while 60 responders treated patients themselves. 245 respondents mentioned that they treated ARF themselves, 50 referred and 48 sometimes referred. With JDM patients 144 referred, 22 treated themselves and 25 responders sometimes referred. 162 responders referred patients with other vasculitides, 43 treated themselves and 49 sometimes referred.

582/590 answered a query regarding the closest access to rheumatology consult. 301(51.7%) mentioned that they have access to pediatric rheumatology services, for 168(28.9%) responders the nearest rheumatology services were provided by adult rheumatologists. 85(14.6%) referred to pediatricians with interest in rheumatology and 15(2.6%) referred to adult physicians with interest in rheumatology. The remaining mentioned that they referred to a medical college, teaching hospital or senior pediatrician.

When asked about referral of patients in specific situations 583/590 responded. 378(64.85) mentioned that they would refer patients with unexplained persistent inflammation, 373(64%) mentioned that they would refer patients with chronic arthritis, 362(62.1%) referred patients who were either RF or ANA positive, 311(53.3%) would refer patients with skin and joint symptoms, 305(52.3%) would refer patients with nonspecific chronic joint pain, 304(52.1%) would refer patients with obvious diagnosis eg. malar rash and 215(36.9%) would refer patients with pyrexia of unknown origin.

DISCUSSION

There are over 23000 pediatricians in India (statistics from Indian Academy of Pediatrics website). The total responders of 590 compared to this overall number are small. However this is the first time such a survey has been attempted and irrespective of the numbers this is a pan-Indian survey with responses from all over the country. The responses from the states were very variable with a good response from the southern, western and the northeastern states and poor response from the states in the north and the east. It’s likely that pediatricians were more interested in taking part in the survey when they had access to pediatric rheumatology services in their state.

Majority of respondents were males between 30 to 40 years of age, and had been in practice for less than 5 years either in teaching hospital or private practice. Younger practitioners generally are more tech savvy and have access to and tend to use hand held gadgets. This could explain the higher response from this group. Majority of pediatricians referred children with rheumatologic diseases to a specialist, very few pediatricians (50) treated patients themselves. These numbers possibly include the 30 plus pediatricians with interest in rheumatology in the country.

301(51.7%) of the responders mentioned that they have access to pediatric rheumatology services and about 30% to adult rheumatologists or adult physicians with interest in rheumatology. The true figures for access to pediatric rheumatology services are likely to be much lower as the response to the survey from some states with virtually no pediatric rheumatology services was poor.

Majority of the pediatricians had encountered children with rheumatologic disorders in their practice (Fig:1). 426, 403, 411, 386 and 355 responders respectively had encountered JIA, HSP KD and SLE, and ARF in their practice. These findings are almost similar to the findings of an American study. India still continues to be one the countries with highest incidence of rheumatic fever in the world. However according to this survey ARF ranked 5th among the rheumatologic conditions seen by pediatrician. The findings of this survey probably mean that pediatricians are seeing fewer patients with acute rheumatic fever than previously seen or signify greater awareness of rheumatologic illnesses among pediatricians.

Not surprisingly children with most common rheuma-
tologic conditions such as HSP, KD and ARF were less likely to be referred. 99(16%) and 60(10%) responders respectively mentioned that they would treat JIA and SLE. This could be due to the lack of access to pediatric rheumatology services locally. However in developed countries all children with rheumatologic illness are cared for by pediatric rheumatologists in tertiary centres. When children with rheumatologic disorders are managed by specialists, treatment is more likely to be started early in the course of disease. An aggressive approach is followed in terms of management to achieve early remission. In JIA for example it has been shown that when children with arthritis are started on disease modulating agents or biologics early in the course of disease joint damage can be prevented7,8.

For the query regarding referral of nonspecific chronic complaints the option that was chosen least was pyrexia of unknown origin (36.9%) (Fig: 2). Though infections are still the common cause of PUO in children it should be born in mind that Systemic JIA, vasculitis including Takayasu arteritis, SLE and to a lesser extent JDM can all present with prolonged fevers as the only manifestation during initial stages of the illness and the diseases may evolve over a period9. Macrophage activation syndrome can be a potential and fatal complication in these conditions10. Where available we suggest that evaluation of children with prolonged fever by a pediatric rheumatologist or atleast a telemedicine consultation when direct
The limitations of the study were the small number of responses and the variations among the states. However studies worldwide have shown that surveys among doctors tend to have low response rates. We could have expanded the scope of the survey by including general practitioners. Considering the sheer size of the country there are practical and technical difficulties in conducting such a nationwide survey. We also felt that we could have included a question on whether pediatricians felt whether there was a need to incorporate pediatric rheumatology module in the medical training curriculum. Also, due to possible confusion among respondents, we did not seek to differentiate between orthopaedic referral patterns and rheumatological referral patterns in children with joint pains.

CONCLUSION

The survey throws light on the awareness of rheumatologic conditions and the referral patterns of such conditions by pediatricians in India. There is a need to expand pediatric rheumatology services across the country particularly in states where it does not currently exist and to improve awareness of rheumatologic conditions among medical graduates. This could be achieved by increasing the number of training programmes in the country and including a module in the undergraduate curriculum. The concept of shared care of a patient between the specialist and the pediatrician needs more acceptance in India.

Acknowledgement: We wish to thank the national and state level office bearers of the Indian Academy of Pediatrics and members of the national pediatric rheumatology society for the help in conducting the survey.

REFERENCES

12. Davies K Cleary G Foster H Hutchinson E BSPAR Standards of Care for children and young people with juvenile idiopathic arthritis Rheumatology, 49(7); 2010, 1406–8
Role Of Scoring Tools In The Documentation Of Efficacy Of Protocol Treatment Of Laryngopharyngeal Reflux Disease

Anjana Saseendran*, Unnikrishnan Menon*

ABSTRACT

Background: Laryngopharyngeal reflux disease (LPRD) is a common disorder presenting to an otolaryngologist. However, the symptoms and signs are usually non-specific, and it is mostly a diagnosis of exclusion. Two reliable tools have been described to get an objective measure of this condition. These are the reflux symptom index (RSI) and reflux finding score (RFS). The standard therapeutic measures for LPRD include a combination of life style modification and medical management, the most commonly used drug being proton pump inhibitor (PPI) with prokinetic agent.

Aim: To evaluate the efficacy of protocol medical management of LPRD, using RSI and RFS as tools.

Method: This is a prospective cohort study of 30 patients treated for LPRD. Diagnosis was made using RSI and RFS. Patients were treated with PPI and Prokinetic agent for a duration of 2 weeks, followed by PPI alone for 6 weeks and improvement in symptoms and signs were reassessed after 8 weeks.

Results: The commonest symptoms were frequent clearing of throat (93%), foreign body sensation throat (93%) and heartburn with dyspepsia (93%). The most common finding was localized or diffuse erythema or hyperemia (100%). Mean RSI and RFS of all patients before treatment with PPI was 17.93 and 7.30 respectively. After 8 weeks of treatment, RSI reduced to 7.1 and RFS to 4.83. p value was found statistically significant for both RSI and RFS. The suggested RFS cut – off score of 7 was found to be unsuitable for our patients.

Conclusion: RSI and RFS are very useful, reliable as well as time saving tools. Further studies may be required to recalibrate the cut off score of RFS, in the Indian population. Patients improved symptomatically after 8 weeks of PPI, but signs did not resolve completely indicating that patients with LPR require a longer course of treatment.

Keywords: Laryngopharyngeal reflux, Proton Pump Inhibitors, RSI, RFS, pH study

INTRODUCTION

Laryngopharyngeal reflux disease (LPRD) is a common disorder. It accounts for about 4 -10% of patients presenting to an otolaryngologist. LPR refers to the backflow of gastric contents into the upper aero-digestive tract1. Gastroesophageal reflux disease (GERD), on the other hand, refers to the backflow of gastric contents into the esophagus and is thought to be physiologic to a certain degree2. Patients with LPR can present with a multitude of non-specific symptoms, including those of upper respiratory tract inflammation3. In fact, there is no symptom that is pathognomonic of LPRD. Classical GERD symptoms such as heartburn and regurgitation may or may not feature in LPRD. Examination findings at laryngoscopy are also non-specific. The gold standard investigations for diagnosis are double pH monitoring and oesophageal manometry4,5. However, these are limited by the need for expensive infrastructure and time requirement. In this scenario, two scoring tools have been described that are easy to use and are fairly reliable. These are the reflux symptom index (RSI) and reflux finding score (RFS)6,7. (Table 1,2)

Standard therapeutic measures for reflux (LPRD and GERD) include a combination of life style modification and medical management, the most commonly used being a combination of proton pump inhibitors (PPI) and prokinetic agent. Response to this empirical treatment is an acceptable initial diagnostic strategy for uncomplicated LPRD. However, this response can be variable. It has been reported in literature that RSI and RFS would help in diagnosing LPRD and in documenting the effectiveness of therapy. The present study is an attempt at confirming the same.

AIM AND OBJECTIVES

To evaluate the efficacy of protocol medical management of LPRD, using RSI and RFS as tools.

To document the RSI and RFS scores in selected LPRD patients.

MATERIALS AND METHODS

Study design: Prospective cohort

Study site: Department of Otorhinolaryngology at Amrita Institute of Medical Sciences and Research Centre, Kochi

Study period: Two years (August 2014 to 2016)

Approval and clearance were obtained from the institutional review board and ethics committee

Patient selection

Inclusion criteria

1. Age: 15 – 70 years
2. RSI> 13
Within the last month how did the following problems affect you? (Circle the appropriate response)  

<table>
<thead>
<tr>
<th>Problem</th>
<th>0 – No problem</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoarseness or other voice problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Clearing throat</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Excess throat mucous or PND</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Difficulty in swallowing food, liquids or pills</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Cough after eating or lying down</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Breathing difficulty or choking episodes</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Troublesome or annoying cough. Sensation of something sticking in the throat</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Heartburn, chest pain, indigestion or stomach acid coming up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total**

### Table 1: Reflux Symptom Index

<table>
<thead>
<tr>
<th>Signs</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subglottic edema</td>
<td>0 – absent</td>
</tr>
<tr>
<td></td>
<td>2 – Present</td>
</tr>
<tr>
<td>Ventricular obliteration</td>
<td>2 – Partial</td>
</tr>
<tr>
<td></td>
<td>4 – Complete</td>
</tr>
<tr>
<td>Erythema/Hyperemia</td>
<td>2 – arytenoids only</td>
</tr>
<tr>
<td></td>
<td>4 – Diffuse</td>
</tr>
<tr>
<td>Vocal fold edema</td>
<td>1 – Mild</td>
</tr>
<tr>
<td></td>
<td>2 – Moderate</td>
</tr>
<tr>
<td></td>
<td>3 – Severe</td>
</tr>
<tr>
<td></td>
<td>4 – Polypoid</td>
</tr>
<tr>
<td>Diffuse laryngeal edema</td>
<td>1 – Mild</td>
</tr>
<tr>
<td></td>
<td>2 – Moderate</td>
</tr>
<tr>
<td></td>
<td>3 – Severe</td>
</tr>
<tr>
<td></td>
<td>4 – Obstructing</td>
</tr>
<tr>
<td>Posterior commissure hypertrophy</td>
<td>1 – Mild</td>
</tr>
<tr>
<td></td>
<td>2 – Moderate</td>
</tr>
<tr>
<td></td>
<td>3 – Severe</td>
</tr>
<tr>
<td></td>
<td>4 – Obstructing</td>
</tr>
<tr>
<td>Granuloma/Granulation tissue</td>
<td>0 - Absent</td>
</tr>
<tr>
<td></td>
<td>2 - Present</td>
</tr>
<tr>
<td>Thick endolaryngeal mucus</td>
<td>0 – Absent</td>
</tr>
<tr>
<td></td>
<td>2 - Present</td>
</tr>
</tbody>
</table>

**Table 2: Reflux Finding Score**
Study design: Prospective cohort
Study site: Department of Otorhinolaryngology at Amrita Institute of Medical Sciences and Research Centre, Kochi
Study period: Two years (August 2014 to 2016)
Approval and clearance were obtained from the institutional review board and ethics committee
Patient selection
**Inclusion criteria**
1. Age: 15 – 70 years
2. RSI> 13
3. RFS> 6
4. Duration of symptoms more than 1 month

**Exclusion criteria**
1. Habit of smoking or consuming excessive alcohol
2. History of regular intake of NSAIDs
3. History and examination suggestive of sinusitis
4. Malignancy of hypopharynx and esophagus
5. Neurological causes of dysphonia and dysphagia
6. History of recent intubation
7. Adverse reaction to proton pump inhibitors

**PROCEDURE**
All patients underwent detailed history and clinical examination by the attending consultant. For the study purpose, the diagnosis of LPR, at first visit, was done on the basis of RSI and RFS. The former is a questionnaire administered to the patient. The latter is based on the subjective findings at rigid or flexible laryngoscopy performed by the consultant/s. Patients were counselled about the diagnosis and advised dietary and lifestyle modifications. They were prescribed Cap. Pan-D SR (Pantoprazole 40mg and Domperidone 3mg) once daily for 2 weeks followed by Tab. Pan 40mg (Pantoprazole) once daily for 6 weeks. They were then reassessed after 8 weeks using the same tools. Further treatment was decided based on the response of the patients.

**Statistical analysis**
All data were coded and entered into SPSS 17 (IBM Corp.). Numerical variables were expressed as mean and standard deviation and categorical variables were expressed as frequency and percentages. To compare the mean difference of pre and post treatment symptoms and signs, Wilcoxon signed rank test was applied.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Total number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoarseness or other voice problems</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>Clearing throat</td>
<td>28</td>
<td>93</td>
</tr>
<tr>
<td>Excess throat mucous or PND</td>
<td>24</td>
<td>80</td>
</tr>
<tr>
<td>Difficulty in swallowing food, liquids or pills</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>Cough after eating or lying down</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Breathing difficulty or choking episodes</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>Troublesome or annoying cough</td>
<td>20</td>
<td>67</td>
</tr>
<tr>
<td>Sensation of something sticking in the throat</td>
<td>28</td>
<td>93</td>
</tr>
<tr>
<td>Heartburn, chest pain, indigestion or stomach acid coming up</td>
<td>28</td>
<td>93</td>
</tr>
</tbody>
</table>

Table 3: Percentage distribution of symptoms (RSI)
RESULTS

Total number of patients included in this study was 30. This was based on statistics-based sample size calculation. There were 22 males (M/F of 2.8:1). Mean age of the study group was 47.70; ranging from 23 to 73 years. Maximum number of patients was in the age group 41 to 50 years.

Commonest symptoms were frequent clearing of throat, foreign body sensation throat and dyspepsia and heartburn, found in 28 cases (93%) followed by excess throat mucus or postnasal drip (80%). Other less common symptoms were troublesome cough (67%), voice related problems (40%), breathing difficulty or choking episodes (33%), dysphagia (23%) and cough after eating.

<table>
<thead>
<tr>
<th>Signs</th>
<th>Total number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infraglottic edema (pseudosulcus)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ventricular obliteration</td>
<td>19</td>
<td>63</td>
</tr>
<tr>
<td>Erythema/hyperemia</td>
<td>30</td>
<td>100</td>
</tr>
<tr>
<td>Vocal fold edema</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td>Diffuse laryngeal edema</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>Posterior commissure hypertrophy</td>
<td>28</td>
<td>93</td>
</tr>
<tr>
<td>Granuloma/Granulation</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Thick endolaryngeal mucous</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 4: Percentage distribution of signs (RFS)

<table>
<thead>
<tr>
<th>Time</th>
<th>n</th>
<th>RSI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pre</td>
<td>30</td>
<td>17.93</td>
<td>4.37</td>
</tr>
<tr>
<td>Post</td>
<td>30</td>
<td>7.10</td>
<td>2.84</td>
</tr>
</tbody>
</table>

Table 5: Change of RSI with PPI therapy

<table>
<thead>
<tr>
<th>Time</th>
<th>N</th>
<th>RFS</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pre</td>
<td>30</td>
<td>7.30</td>
<td>1.34</td>
</tr>
<tr>
<td>Post</td>
<td>30</td>
<td>4.83</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Table 6: Change of RFS with PPI therapy
Fig 1: Endoscopic view showing diffuse erythema with posterior commissure hypertrophy

Fig 2: Endoscopic view showing partial ventricular obliteration

Fig 3: Endoscopic view showing diffuse laryngeal edema
or lying down (17%) (Table 3).

The most common laryngeal finding was erythema/hyperemia, which was found in all 30 cases (100%). (Figure 1) The next common finding was posterior commissure hypertrophy (93%), followed by ventricular obliteration (63%) and vocal fold edema (40%). The least common findings were diffuse laryngeal edema (27%), granuloma (3%) and thick endolaryngeal mucous (3%). (Figure 2,3) None of our patients had infraglottic edema or pseudosulcus. (Table 4)

Mean RSI of all patients before treatment with PPI was 17.93 with a standard deviation of 4.37. After 8 weeks of treatment, RSI reduced to 7.10 with a standard deviation of 2.84. Decrease in RSI was found to be statistically significant (P value <0.001). (Table 5)

Mean RFS of all patients before treatment with PPI was 7.30 with a standard deviation of 1.34. After 8 weeks of treatment, RFS reduced to 4.83 with a standard deviation of 1.18. Decrease in RSI was found to be statistically significant (P value <0.001). (Table 6)

DISCUSSION

Patients with LPR present with non-specific symptoms and signs. The usual symptoms are globus sensation, vocal fatigue, chronic throat clearing, excessive throat mucous, post-nasal drip, choking episodes etc. The most common laryngoscopic finding is reflux laryngitis. Other findings include inter-arytenoid erythema or hyperemia, pseudosulcus or infraglottic edema, ventricular obliteration, posterior commissure hypertrophy, granuloma or granulation tissue formation, thick endolaryngeal mucous production etc.

The RSI is a 9 item self administered outcome questionnaire. The score ranges from 0-45 (45 being the worst possible score). An RSI of more than 13 is considered to indicate LPR. The RFS is an 8 item clinical severity rating scale based on rigid or flexible laryngoscopy findings. The score ranges from 0 – 26 (26 being the worst possible score). An RFS greater than 7 has more than 95% probability of having LPR.

Belafsky et al, Toros et al and many other studies found LPRD more prevalent in women. In our study of 30 patients, LPRD was found predominantly in males (73%, n=22) as compared to females (26%, n= 8). The mean age of the study group was 47.70. There was no correlation between age of the patient and pre-treatment and post-treatment RSI and RFS.

The commonest symptom at presentation reported by Mesallam et al, Karkos et al and other studies was globus pharyngeus, whereas Kaufman et al reported hoarseness and Eubanks et al reported cough as the commonest symptom. The commonest presenting symptoms in our study were frequent clearing of throat (93%), foreign body sensation throat (93%) and heartburn with dyspepsia (93%). The next common symptom reported was excess throat mucus or postnasal drip (80%). Other less common symptoms were troublesome cough (67%), voice related problems (40%), breathing difficulty or choking episodes (33%), dysphagia (23%) and cough after eating or lying down (17%).

Mesallam et al, Karkos et al and other studies found erythema as the commonest sign. Belafsky et al noted posterior commissure hypertrophy and Tezel et al noted partial ventricular obliteration as the most common laryngoscopic sign. Belafsky et al found pseudosulcus in 70% of patients with LPRD and suggested that presence of infraglottic edema or pseudosulcus vocalis alone is suggestive of diagnosis of LPRD with a sensitivity of 70% and specificity of 77%.

In our study, the commonest laryngoscopic finding was localized or diffuse erythema/ hyperemia which were found in all our patients (100%). The next common finding was posterior commissure hypertrophy (93%), followed by ventricular obliteration (63%) and vocal fold edema (40%). The least common findings were diffuse laryngeal edema (27%), granuloma (3%) and thick endolaryngeal mucous (3%). None of our patients had infraglottic edema or pseudosulcus.

Analysis of our patients’ symptoms reveal differences from those reported in the earlier studies discussed above. The laryngoscopic findings also differ slightly, except for the major finding of erythema/ hyperemia, which is the same in most of the studies including the present one. Our findings seem to suggest that infraglottic edema need not be a diagnostic criterion for LPRD.

Niran et al in their prospective study comparing the efficacy of domperidone in combination with omeprazole vs omeprazole alone employed only RSI as the inclusion criterion. There are also other studies which have done the same. They found RSI to be a sufficient inclusion criterion for identifying patients with LPRD. Belafsky et al quoted in his study that RSI of 13 be considered abnormal and RFS of 7 or be taken as indicative of 95% certainty of LPRD. Based on this study, initially RFS cut off score was taken as 7 but the required sample size could not be met. This was because there were not enough patients with findings reaching the cut off score of 7, even with an RSI of more than 13. Hence, we took the decision to change the cut off score of RFS to 6 for our study. This could potentially be a focus for future study.

In various studies reviewed by Christina Reimer and Peter Bytzer, the medications prescribed were Lanzoprazole, Omeprazole, Pantoprazole, Rabeprazole and Esomeprazole and the duration of treatment varied from 6-24 weeks. The open label trials conducted by Kamel et al, Hanson and others reported resolution of the symptoms within the treatment period. However, randomized double blind placebo controlled trials of PPI in LPR by Havas et al, Noordzij et al and others reportedly did not find any significant difference in the outcome measure for symptoms between PPI and placebo.
The patients had undergone upper GI endoscopy, dual pH monitoring and esophageal manometry in most of the above studies. All patients in our study were treated with a combination of Pantoprazole 40mg and Domperidone once daily on empty stomach for a period of 2 weeks followed by Pantoprazole 40mg alone for 6 weeks. The role of PPI was assessed using the two scoring systems, RSI and RFS. We did not resort to pH monitoring as the equipment, situated in the Gastroenterology department, was not functional during the study period. All our patients had significant improvement in symptoms within 8 weeks of treatment. The mean pre-treatment RSI was 17.93 which reduced to 7.10 after 8 weeks of PPI. This decrease in RSI was found to be statistically significant. Although laryngoscopic findings improved with 8 weeks of PPI, they did not resolve completely. The mean pre-treatment RFS was 7.3, which reduced to 4.8. It needs to be emphasized that the aforesaid treatment is to control acid reflux but not effective for controlling bile salts, pepsin, bacteria and pancreatic proteolytic enzymes.

Lifestyle modifications were also suggested along with treatment. These play a significant role in resolution of the symptoms. None of the patients in our study had any adverse reaction to Pantoprazole. As the signs have not been fully resolved, continuation of the treatment beyond 8 weeks is necessary. We did not follow up our patients beyond 8 weeks due to shorter duration of our study period. It therefore appears that the treatment for up to 20 – 24 weeks would be required for complete resolution as reported in previous studies.

CONCLUSIONS

The protocol management for LPRD (combination of PPI and prokinetic agent) is efficacious, as objectively documented by the two scoring systems, RFI and RFS. Our patients improved symptomatically within 8 weeks of PPI therapy, but laryngeal signs did not resolve completely. RFI and RFS are useful and reliable for the purpose of objective documentation of LPRD, with the advantage of bearing no extra cost and not being personnel intensive.

Some patients with RSI of more than 13 were found to have RFS of less than 7. These patients responded equally well to the anti-reflux treatment, which confirmed the diagnosis of LPRD. Hence the present cut-off of RFS (score 7) appears to be unrealistic as a diagnostic criterion for LPRD.

LPRD seems to be commoner in males, as against international literature reports.

Limitations

The “gold standard” tests (pH and manometry) were not used in any of our patients. Only a single follow-up, at 8 weeks, was done.

Recommendations

Any patient presenting with vague throat symptoms should be suspected to have LPRD and started on anti-reflux measures readily. RSI and RFS should be used for such patients. Further studies may be required to decide the cut off for RFS.

REFERENCES

15. Christina Reimer, Peter Bytzer. Review article: Management of laryngopharyngeal reflux with proton pump inhibitors. Therapeutics and Management 2008;4 225-33


The Clinical Profile of Pediatric Patients Coming to Emergency Department
Anjin Paul*, Sreekrishnan T P*, Dhanasekaran B S*, Gireesh Kumar*

ABSTRACT
Background: Paediatric patients are a group of vulnerable population in obvious need of continuity of care for growth and development, anticipatory guidance and nutrition. Parents who repetitively use the emergency department (ED) for non-urgent care create potential and hinder the care for emergency patients who need urgent care.
Objectives: This study was designed to study the clinical profile of paediatrics in emergency department, to identify the common complaint of paediatric emergency department visits and to triage them to assess the nature of care they are seeking for, urgent or no urgent.
Methods: This is a prospective observational study on all the 200 paediatric patients (new born to 12 years of age) who visited ED of Amrita Institute of Medical Sciences, Cochin from July 2017 to December 2017. The entire patients with age of birth to 12 years were included in this study. The clinical profile of patients studied include age, sex, heart rate, respiratory rate, oxygen saturation, blood pressure, temperature, laboratory parameter includes CRP and to advices for admission and discharge.
Result: Out of 200 patients included in the study, 121 (60%) were boys. The age distribution of patient was ; <1 year (19%), 1-4 year (38.5%), 5-9 years (22.5%), 10 – 12 years (20%). Genders mean (1.39 ± 0.49), age mean (2.46 ± 1.017) on triaging the patients in green category 63% (126), yellow category 24% (47) and red category 13% (27). The nature of common complaint was predominantly fever of non-urgent nature.
Conclusion: The present study analysed the clinical profile of the paediatric patients coming to our emergency department and categorized them whether they are brought for urgent or non-urgent care, this will throw light on formulating strategies for the efficient and appropriate use of ED.
Key words: Emergency department, paediatric visit, common complaint

INTRODUCTION
The usage of EDs for common complaints has saturates the capacity of EDs and is leading to excessive health-care spending, as well as unnecessary testing and treatments, preventing the efficient and effective usage and quality of EDs. Visiting EDs for common complaints concerns may unnecessarily crowd the department, leading to longer waiting times, adverse events due to delays in care and increased costs. Many of the ED visits could have been managed in a primary care setting, and this has been shown to improve health outcomes. Parents take their children to EDs for common complaint care because of the advantages of ED care.
Parents who repetitively use the emergency department (ED) for common complaints create potential risk for their children. This phenomenon is influenced by inconvenient primary care office hours, insurance issues, and guaranteed same day services in the ED. Essentially, parents are using the ED as a primary care office, rather than a place for the care of urgent illness. This is a serious health concern as children do not receive continuity of care nor do they receive a focus on preventative healthcare when their primary place of obtaining care is solely in the ED. This case study presents an example of inappropriate, repeated ED use and offers potential solutions that enhance parental, ED provider, and primary care provider (PCP) accountability; enhancing the ability to provide appropriate care to a vulnerable population. ED providers need to consistently refer the paediatric patient back to the PCP and investigate methods that would facilitate the required decrease in non-urgent ED visits. This will require the ED provider to be pro-active and resolute in the management of the paediatric patient with frequent ED visits. Most adult ED providers are uninformed of the extent of inappropriate ED use by the paediatric population, so merely contribute to the misuse by acquiescing to rapid discharge of the common complaint paediatric patient.
This study was designed to develop a descriptive profile of parents and caregivers who bring their children to the emergency department for common complaint as well as exploring the reasons for presenting to an urban hospital paediatric emergency department for non-urgent conditions. Such work is necessary in order to develop effective interventions.
METHODOLOGY
Inclusion criteria
Children with age of birth to 12 years.
Materials and methods
This is a prospective observation study on 200 patients who had visited ED of amrita institute of medical sciences, Cochin. Non-urgent visits to paediatric (<12 years old) were analyzed. This is a single-centre, prospective
### Characteristics of study population

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean = 1.39 ± 0.49</th>
</tr>
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<tbody>
<tr>
<td>Male</td>
<td>60%</td>
</tr>
<tr>
<td>Female</td>
<td>40%</td>
</tr>
<tr>
<td>Age</td>
<td>Mean = 2.46 ± 1.017</td>
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</tbody>
</table>

#### Vitals

<table>
<thead>
<tr>
<th>Age</th>
<th>Heart Rate</th>
<th>Blood pressure (MAP)</th>
<th>Respiratory Rate</th>
<th>Oxygen Saturation</th>
<th>Temperature</th>
<th>GRBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>Mean = 137.24 ± 16.32</td>
<td>Mean = 59.66 ± 3.954</td>
<td>Mean = 35.84 ± 7.077</td>
<td>Mean = 98.68 ± 7.66</td>
<td>Mean = 99.13 ± 1.49</td>
<td>Mean = 89.66 ± 12.62</td>
</tr>
<tr>
<td>1-4 year</td>
<td>Mean = 113.07 ± 17.26</td>
<td>Mean = 60.83 ± 4.957</td>
<td>Mean = 28.20 ± 5.332</td>
<td>Mean = 98.49 ± 2.64</td>
<td>Mean = 99.15 ± 1.23</td>
<td>Mean = 99.72 ± 10.88</td>
</tr>
<tr>
<td>5-9 year</td>
<td>Mean = 111.11 ± 16.27</td>
<td>Mean = 62.73 ± 3.595</td>
<td>Mean = 24.98 ± 5.128</td>
<td>Mean = 116.98 ± 127.57</td>
<td>Mean = 98.81 ± 1.21</td>
<td>Mean = 111.06 ± 13.91</td>
</tr>
<tr>
<td>10-12 year</td>
<td>Mean = 109 ± 16.20</td>
<td>Mean = 68.53 ± 6.189</td>
<td>Mean = 28.20 ± 5.332</td>
<td>Mean = 98.68 ± 7.66</td>
<td>Mean = 98.76 ± 1.31</td>
<td>Mean = 114.8 ± 9.56</td>
</tr>
</tbody>
</table>
This prospective observational study included 200 patients who came to ED were randomly selected from the Emergency Room of Amrita Institute of Medical Sciences and Research Centre. Among the 200 patients included in the study 60% were males and remaining 40% were females.

Among the children < 1 year, the normal temperature is 99.4 – 99.7°F. The temperature distribution in this age group was 11.5% (23) had temperature <99.4°F, 1% (2) had 99.4-99.7°F, 2% (4) had 99.8-100°F and 4.5% (9) had temperature >100°F. Temperature in children between 1-4, normal temperature is between 98.6 - 99°F. Here 9.5% (19) had temperature <98.6°F, 14.5% (29) had 98.6-99°F, 8% (16) had 99.1 - 100°F and 65% (13) had temperature >100°F. In children between 5-9 year, the normal temperature is between 98.1-98.3°F. 2.5% (5) had temperature <98°F, 3.5% (7) had between 98.1-98.3°F, 10% (20) had between 98.4 - 100°F and 2.5% (5) had temperature >100°F. The normal temperature 97.8°- 98.6°F, 4.5% (9) had between 98.4°F, 2.5% (5) had 99.4- 100°F and 2% (4) had temperature >100°F.

Patients were classified according to age, as follows, <1year, 1-4 year, 6-9 year and 10-12 year. It was analyzed the characteristics of non-urgent visits of PEDs, (1) age and sex of the patient, (2) rate of treatment upon observation, admission and discharge. (3) Vital parameters such as Heart rate, Respiratory rate, Oxygen saturation, Blood pressure, Temperature and laboratory parameter includes CRP. Investigations like X-ray, CT/MRI and medication both IV and oral were taken.

Although the complaints could be consider as non-urgent, admission can be necessary. Also obtained data regarding non-urgent, non- vital, possible treatment at home of the emergency departments.

RESULT

This prospective observational study included 200 patients who came to ED were randomly selected from the Emergency Room of Amrita Institute of Medical Sciences and Research Centre. Among the 200 patients included in the study 60% were males and remaining 40% were females.

Among the children < 1 year, the normal temperature is 99.4 – 99.7°F. The temperature distribution in this age group was 11.5% (23) had temperature <99.4°F, 1% (2) had 99.4-99.7°F, 2% (4) had 99.8-100°F and 4.5% (9) had temperature >100°F. Temperature in children between 1-4, normal temperature is between 98.6 - 99°F. Here 9.5% (19) had temperature <98.6°F, 14.5% (29) had 98.6-99°F, 8% (16) had 99.1 - 100°F and 65% (13) had temperature >100°F. In children between 5-9 year, the normal temperature is between 98.1-98.3°F. 2.5% (5) had temperature <98°F, 3.5% (7) had between 98.1-98.3°F, 10% (20) had between 98.4 - 100°F and 2.5% (5) had temperature >100°F. The normal temperature 97.8°- 98.6°F, 4.5% (9) had between 98.4°F, 2.5% (5) had 99.4- 100°F and 2% (4) had temperature >100°F.
The Clinical Profile of Pediatric Patients Coming to Emergency Department

**Age Group <1 Year**

- Green area: 10%
- Yellow area: 10%
- Red area: 10%

Showing distribution of vital in age group <1 year.

**Age Group 1-4 Year**

- Green area: 26.50%
- Yellow area: 8%
- Red area: 4%

Showing distribution of vital in age group 1-4 year.

**Age Group 5-9 Year**

- Green area: 11.50%
- Yellow area: 4.50%
- Red area: 4.00%

Showing distribution of vital in age group 5-9 year.

**Age Group 10-12 Year**

- Green area: 11.50%
- Yellow area: 4.50%
- Red area: 4.00%

Showing distribution of vital in age group 10-12 year.
Showing the distribution of complaints.

Showing the distribution of age.
DISCUSSION

The main presenting complaint in this study is fever 36.5% (73) followed by seizure 12.5% (25). Often, paediatrics patients visited EDs during day and hours in which the primary care paediatric centre was closed, that is on the weekends and in the evening hours.

In a similar published study shows that one third of paediatrics patients visited EDs for observation and treatment of common illness of non urgent nature. In this study of all children visiting ED, 54.9% were boys and belonging to the age group was 1-4 years. In our study also 61% were boys and the most of them belonged to the same age group of 1-4 years (39%).

Many authors found the patient age as a predictor for inappropriate ED visits. Detailed clinical, familial and social data are needed to determine the true reason for frequent visits to ED in this age group3-8. The neonatal period (<28 days old) is a vulnerable period of paediatric health where emergencies can certainly occurs. For newborns, hospital care after birth and early primary care may have a significant impact on health care service usage10-12. We investigated this group <1 year, and did not assess them separately.

In this study we have taken adolescents of age from 10-12 years who visited ED due to non-urgent complaints as vulnerable group, they reported urgent concerns such as unintentional injuries and crashes. Fatigue and headache were more common in the adolescent group.

The percentage of admitted patients was 41% and the rest were discharged after care and observation. These results show that patients who visited ED are usually discharged. The lower admission rate and higher rate of treatment upon observation suggest that ED have a higher workload for hospitals which will try to compromise and delay the care of those patients coming to ED with urgent complaints. In addition, bed occupying by non urgent care patients will leave the urgent care patients in jeopardy.

Presenting complaints differed according to season and number of visits during different seasons differed according to age group. This need to be investigated to understand the nature of the diagnosis according to the seasons and the national data on viral or allergic diseases.

We found that complaints were different depending on the time of the ED visit. Visits of ED most commonly occurred due to the complaint of fever of 36.5% followed by seizure 12.5% and other complaint with smaller percentage. Visits were more frequent for 1-4 years of age. This probably reflects higher anxiety and need for reassurance in parents.

A 2006 study from the state children health insurance program of New York City suggested that about 20% parents are brought to the ED during evening hours 9.

Parents often over estimate the severity of their child’s conditions as urgent; parents need to be educated by physician, as most of the paediatric condition can be prevented. When illness arises, only a few are of genuinely urgent conditions, Thus illness may be acute but usually do not require an extensive all – inclusive treatment at a ED.

Study limitations

This study has certain limitations; it included only one private hospital, such that results cannot be readily generalized. Thus there may be variation in the reasons for non urgent paediatric care in other EDs and other regions of the country. It will be important to examine the trends of other public hospitals in future studies.

CONCLUSION

The present study describes the clinical profile of paediatric patients who visited our emergency department for care and management. The results revealed that typically, a paediatric patients visit ED for non urgent paediatric complaints rather than urgent care complaints or accidents. The most common complaint was fever of 36.5% (73). This leads to an increased number of visits, which in turn leads to longer waiting times, causing patient dissatisfaction. A combination of high patient load and limited emergency care facilities present a serious problem. Most ED visits could have been managed by the Primary Care Providers (PCP) themselves; accessibility to primary care or preventative care 24*7 and providing parental education about how to address childhood illness will be able to decrease the number of visits to ED for non-urgent complaints. The further studies to find out why parents come with their children to ED with non-urgent conditions should be planned. Also parents should be trained about urgent and non-urgent conditions. All the above will enable EDs to provide appropriate care for appropriate patients with maximum efficiency and cost effectiveness.

REFERENCES


4. Vedovetto A, Soriani N, Merlo E, Gregori D. The burden of inappropriate emergency department pediatric visits: why Italy


9. Sempere-Selva T, Peiró S, Sendra-Pina P, Martínez-Espin C, López-


Health Care Seeking Behaviour of Migrant Labourers in Ernakulam District, Kerala
Aman Bhardwaj*, Teena Mary Joy*, Rakesh P S*

ABSTRACT

Introduction: Internal migration for earning a livelihood has been a pronounced trend across the globe. A number of sociocultural and economic factors limit healthcare accessibility and increase vulnerability of the low-wage migrant worker. We conducted a cross-sectional study among the non-domestic migrant workers in Ernakulam district to better understand the potential barriers they face in accessing healthcare.

Materials and Methods: Kochi Metropolitan Area in Ernakulam district is referred to as the economic capital of Kerala and is recognized as one of the major industrial cities in India. Face to face interview was conducted with 239 migrant labourers from five migrant settlements in Kochi in their regional language. Data was entered in Microsoft Excel and was analysed using SPSS Version 18. Descriptive statistics including frequencies and percentages were done.

Results: Mean age (SD) of participants was 32 (12.55). Among them 77% were aware of nearby Government health care facilities. Of these, 59% said that they used to seek health care from Government facilities. Majority of them (85.4%) were happy with the health care facilities available here. Of the latter, 56% had out of pocket direct medical expenditure for health. When asked about the major issues faced by them in accessing health care, financial reasons were cited by 20%, language barrier by 15% and inconvenient timings of health centres by 12.9%.

Conclusion: Identified barriers for seeking health care among migrants in Kochi include knowledge gaps and financial barriers. Though majority of the migrants were happy with the health care facilities available here, much need to be done to ensure universal health coverage in the state.

Keywords: Ernakulam, Kerala, migrant

Corresponding Author: Rakesh P S, Clinical Assistant Professor, Dept. of community medicine, AIMS, Kochi..

INTRODUCTION

Internal migration for earning a livelihood has been a pronounced trend across the globe¹. Workers migrating within a country usually move from less developed regions to more developed ones. According to an examination of official employment statistics from industries that predominantly employ migrant workers, it is estimated that at there are at least 100 million internal migrant workers in the country².

Kerala, a state in southern India, has a long history of in migration mainly from the neighbouring south Indian states, particularly Tamil Nadu. But in the last one and a half decades, Kerala has been witnessing unprecedented flow of unskilled labourers from far off states in East, North and North-east India. Kerala is likely to have 3.5 to 4 million inter-state migrant workers in 2017³. Many are low or semiskilled workers employed under a short-term contractual basis, performing jobs either in the domestic sector or non-domestic jobs.

Migrant labourers are at a significant disadvantage in the community into which they have migrated. They are in unfamiliar territory amidst strangers. They are also not familiar with the language and culture of the new place. In addition, they may also feel discriminated against by the members of society as they “belong to another culture”. As a result of these factors, migrant labourers may be deprived of access to healthcare facilities and services⁴.

A number of sociocultural and economic factors limit healthcare accessibility and increase vulnerability of low-wage migrant worker. They are also subject to increased risk of work-related injury, infectious diseases and poor psychological health⁵-ⁱ⁰. Poor health outcomes among migrant workers are further exacerbated because of these barriers, and as a result, improvements in migrant worker healthcare access combined with targeted preventive public health initiatives are considered to concretely improve migrant worker health outcomes and reduce vulnerability. Achieving universal health coverage have been included in the UN 2030 agenda for Sustainable Development¹¹. This has relevance in the context of increased migration across the globe. Little has been investigated on perspectives of migrant workers in accessing healthcare. We conducted a cross-sectional study among the non-domestic migrant workers to better understand the potential barriers they face in accessing healthcare.

MATERIALS AND METHODS

Kochi Metropolitan Area (Kochi Urban Agglomeration) in Ernakulam district of Kerala is the largest urban agglomeration in Kerala. Kochi Metropolitan Area is referred to as the economic capital of Kerala and is recognized as one of the major industrial cities in India¹². Ernakulam is one of the major construction hubs in the state, with most of the large-scale constructions concentrated within or near the Kochi urban agglomeration.
including Kochi Metro Rail, expansion of Kochi Refinery, expansion of Kochi International Airport, LNG Terminal at Puthuvype and Infopark. These major and constructions depend heavily on migrant workers. Apart from construction, petroleum refining, plywood, fishing, furniture, textiles and wearing apparel, mining and quarrying and food processing industries in Ernakulam also attract many migrant labourers. Ernakulam emerged as one of the top choices for migrants from the north and north-east states, as the living standards for migrants is far better here than in other cities.\(^\text{13}\)

A questionnaire was developed capturing health-related practices including current healthcare usage patterns, affordability and barriers to access. Demographic information was also included. The questionnaire was translated into the native languages of respondents: Bengali, Hindi and Tamil, and was piloted among migrant workers to ensure feasibility of the questions.

Five migrant settlement camps were visited on Sundays. Camps were identified with the help of Labour department. A comprehensive medical check-up for migrants was also arranged at their settlement on the same day by the district administration with prior intimation. Face to face interview was conducted with all migrant labourers available there in their regional language. Translators were available from local NGOs who work for migrant welfare who can handle both languages. It took approximately 15 minutes to complete the interview for one.

Data was entered in Microsoft Excel and was analysed using SPSS Version\(^\text{18}\). Descriptive statistics including frequencies and percentages were done.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean (SD)</td>
<td>32.08 (12.55)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>176 (73.6%)</td>
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<tr>
<td></td>
<td>Female</td>
<td>63 (26.4%)</td>
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<tr>
<td>Marital Status</td>
<td>Unmarried</td>
<td>99 (41.4%)</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>137 (57.3%)</td>
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<td></td>
<td>Widow/er/ separated</td>
<td>3 (1.2%)</td>
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<td>Educational status</td>
<td>No formal education</td>
<td>67 (28%)</td>
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<td>Primary</td>
<td>40 (16.7%)</td>
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<td>Upper Primary</td>
<td>58 (24.3%)</td>
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<td>High school &amp; above</td>
<td>74 (30.9%)</td>
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<tr>
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<td>Tamil Nadu</td>
<td>46 (19.2%)</td>
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<td>Assam</td>
<td>37 (15.5%)</td>
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<tr>
<td></td>
<td>Bangladesh</td>
<td>36 (15.1%)</td>
</tr>
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<td></td>
<td>West Bengal</td>
<td>32 (13.3%)</td>
</tr>
<tr>
<td></td>
<td>Karnataka</td>
<td>30 (12.5%)</td>
</tr>
<tr>
<td></td>
<td>Odissa</td>
<td>16 (6.6%)</td>
</tr>
<tr>
<td></td>
<td>Uttar Pradesh</td>
<td>14 (5.8 %)</td>
</tr>
<tr>
<td></td>
<td>Jharkhand</td>
<td>12 (5.0 %)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>16 (6.6%)</td>
</tr>
</tbody>
</table>

Table 1: Socio demographic characteristics of the study participants (N=239)

**RESULTS**

A total of 239 migrant workers were interviewed. Socio demographic characteristics of the participants were shown in Table 1. Mean age (SD) was 32 (12.55) and median being 28. Of them 28% (67/239) did not had any formal education. Of them, 210 (87.9%) reported that this was their first migration. 132 (55.2%) came to know about this through their friends while 91 (38.1%) came as being canvassed by agencies.

Among them, 48 (20.1%) said they used to visit their original state on monthly basis, 70 (29.3%) used to visit twice in a year and 55 (23%) used to visit yearly.
Among them 77% were aware of nearby Government health care facilities. Of them 59% said that they used to seek health care from Government facilities. Majority of them (85.4%) were happy with the health care facilities available here. Of these, 56% had out of pocket direct medical expenditure for health. About 8.4% of them felt that they had not received health care on time due to some reasons. When asked about the major issues faced by them in accessing health care, financial reasons were cited by 20%, language barrier by 15% and inconvenient timings of health centers by 12.9%. The details are given in Table 2.

<table>
<thead>
<tr>
<th>Question</th>
<th>Responses</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company/employer/contractor-based treatment facility available</td>
<td>No</td>
<td>194 (81.2%)</td>
</tr>
<tr>
<td>Did you visit any health facility in last 30 days?</td>
<td>Yes</td>
<td>63 (26.4%)</td>
</tr>
<tr>
<td>Do you know the Government health facility nearby?</td>
<td>Yes</td>
<td>184 (77.0%)</td>
</tr>
<tr>
<td>Where did you usually seek health care from?</td>
<td>Government</td>
<td>141 (59%)</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>98 (41%)</td>
</tr>
<tr>
<td>Are you happy with the healthcare facilities available here?</td>
<td>Yes</td>
<td>204 (85.4%)</td>
</tr>
<tr>
<td>Have you made any direct payment for obtaining health care including fee, drugs, laboratory tests?</td>
<td>Yes</td>
<td>134 (56.1%)</td>
</tr>
<tr>
<td>Do your employer/company/ insurance pay for your medical needs?</td>
<td>No</td>
<td>156 (65.3%)</td>
</tr>
<tr>
<td>Have you ever felt that you had not received healthcare here on time?</td>
<td>Yes</td>
<td>20 (8.4%)</td>
</tr>
<tr>
<td>Major issues faced by you for accessing health care</td>
<td>Financial Issues</td>
<td>48 (20.0%)</td>
</tr>
<tr>
<td></td>
<td>Language barrier</td>
<td>37 (15.5%)</td>
</tr>
<tr>
<td></td>
<td>Inconvenient timings</td>
<td>31 (12.9%)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>20 (8.3%)</td>
</tr>
<tr>
<td></td>
<td>No issues</td>
<td>103 (43%)</td>
</tr>
</tbody>
</table>

Table 2: Details of health seeking of migrant labourers (N=239)

DISCUSSION

The Kerala government has taken several steps to deal with the challenges arising from the influx of migrant labourers. The most important among these is the introduction of a welfare programme for migrant workers. Under the programme, these labourers receive higher welfare benefits than before, assistance for medical care, assistance in the event of accidents leading to death and educational assistance for their children.

Kerala is the first State in India to enact a social security scheme for the migrant workers and the State is the first to provide benefits to the job-seekers from outside with the Kerala migrant workers’ welfare scheme set up in 2010.14,15 In 2016, a new insurance scheme called Aawaz was launched to provide social security to the migrant workers.16 The state currently offers free health care for all the migrant workers and is planning legislation to address the migrant labourers issue with “The Kerala Migrant Workers Social Security Bill”. In 2017, the government announced a health insurance scheme for migrant labourers which included free treatment worth Rs. 15000 and medical insurance with accident coverage.

We identified potential barriers to healthcare among low-wage non-domestic migrant workers in Ernakulam, Kerala. These include knowledge gaps and financial bar-
riers. The reasons for these are probably multifaceted and merit further study.

There were also barriers in accessing health care viz. language barriers, inconvenient timings of the government hospitals, lack of knowledge about the public provisioning of health care. The presence of a public health care system which is responsive to the needs of the migrants is a necessity. Such a system should be sensitive to the cultural, linguistic and social backgrounds of the migrants. Though a higher proportion of migrants accessed public sector than private sector as compared to local population there, still a quarter of migrants are not aware about the public health facilities. They consult physicians who can communicate with them at least in Hindi. However, of late, the public health system in the state is slowly realizing the implications of not addressing the health issues of the migrant population as it has started affecting the health of the local population also. Some efforts to create awareness among the migrants through pamphlets printed in Hindi, Oriya and Bengali have been undertaken. However, public health personnel agree that only a section of the migrants is reached through such interventions. They attribute it to inadequate human resources available at their disposal. The availability of public health staff for field work has not changed even in pockets where migrants are concentrated in large numbers. Also, the strategy employed is to reach out to the migrant labourers through their employers where the willingness of the latter is a major determinant. Moreover, such a strategy will not help to reach out to casual labourers, domestic workers and those employed in small establishments.

Interventions should be directed towards improving the knowledge of migrant workers with regard to their entitled healthcare coverage, and also diminishing financial barriers to accessing care. Timings of primary health centers in urban area could be modified/extended as many felt the current timing as inconvenient to them.

Our study may not represent the full spectrum of healthcare experiences and beliefs of migrant workers. In addition, there could be some degree of misinterpretation due to language barriers. Not using a validated tool is another limitation of the study. Despite these limitations, the study has good public health implications and will help the state and Local Self Government in planning policies for migrant workers in the state.

To summarise, migrant labourers were generally happy with the health care facilities available to them in Ernakulam district. Still one fourth of migrants are not aware of government facilities. More than half of them had out of pocket expenditure as direct medical cost for accessing health care. Barriers for accessing health care include financial, language and inconvenient timings of health centres.

REFERENCES

Type of Personality And Dental Caries, Are They Related?  
A Cross-Sectional Survey Among Dental Students

Sravan Kumar Yeturu*, U S Ram Vibakar Raj*, Nandita Venkatesh*

ABSTRACT

Aim and Objectives: To assess personality traits, prevalence of dental caries and to find any association between personality traits and dental caries in dental students.

Materials and methods: A cross sectional study was conducted in a dental institution in Kerala. Personality trait was assessed using the short-form revised Eysenck personality Questionnaire (EPQ-S) which consisted of 48 questions. DMFT was used to record prevalence of dental caries. Statistical analysis was done using SPSS ver 18. Chi square test and Kruskal Wallis test were used to find any associations. P value of <0.05 was considered significant.

Results: A total of 197 students participated in the study. The mean age was 20±1.3 and 89.8% were females. A total of 79 (40.1%) were classified as Extroversion, 33 (16.8%) as Neurociticsm, 34 (17.3%) as Lie scale, 15 (7.6%) as Psychotiscm and 36 (18.3%) as Mixed according to the scale used. The mean dental caries experience was 2.2±2.4.

Conclusion: The personality trait and dental caries in this study did not show any significant association. However, gender and year of study showed a significant relation with type of personality.

Keywords: dental caries experience, personality traits, prevalence, students.

INTRODUCTION

In the recent years, the utilisation of dental services has increased mainly because of increase in knowledge and awareness but most people find the dental procedures distressing and try to avoid them. The psychosocial factors like personality, stress, coping and social support can influence the health related behaviours such as tobacco use, alcohol consumption and physical activity. The overall health of an individual can be affected by his thoughts, attitude and behaviour, which in turn reflects his personality type.

Personality can be defined as “the combination of characteristics or qualities that form an individual’s distinctive character”. It is the characteristic behaviour-response pattern that every person develops, both consciously and unconsciously, as his or her style of life. Many studies in literature have reported the relationship of personality as a risk factor to many chronic conditions as coronary heart diseases, cancer and various mental disorders.

The determinants of oral health include many psychological and social factors. A study reported that parameters of saliva like pH, flow rate, rate of secretion and mineral content vary depending on the type of personality. The personality traits are also closely related to dental anxiety and fear which can directly affect the oral health behaviours. The experience from previous visit or first dental visit can also affect the dental anxiety. The neurotism personality type was found to be related to dental anxiety and can be defined as “a personality trait that involves one experiencing negative emotions — as anger and depression — accompanied by disruptive behaviour and distressed thinking”.

The two major oral health problems are Dental caries and periodontal disease, which are universal in distribution and are the main reason for tooth mortality. A study reported that stress, depression and inadequate coping can contribute to development and progress of these oral diseases.

There have been many studies reporting the risk factors of dental caries, but many gaps still exist. Literature search showed the lack of studies in assessing the relation between the type of personality and dental caries experience.

This study was conducted with the aim to find any relation between personality trait and dental caries experience and with the objectives of assessing the type of personality traits and prevalence of dental caries in dental students.

METHODS

A cross-sectional questionnaire survey was done among dental students in a dental college of South India. All the students who were present on the day of survey and those who are willing to participate were included. Prior approval from Institutional Ethical Committee was obtained.

All the students were invited to participate in the survey which used a standardised self-administered questionnaire. Students were instructed to respond to the items in the questionnaire followed by clinical examination. The questionnaire consists of two components: first component consisted of demographic information.

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*Public Health Dentistry, AIMS, Amrita Vishwa Vidyapeetham, Kochi, India.
RESULTS

A total of 197 students completed survey of which 89.8% were females. The mean age of the participants was 20±1.32 (range 17-23) years. A total of 41 students from 1st year, 39 students from 2nd year, 76 from 3rd year and 41 from 4th year participated in the study. Nearly 2/3rd (75.1%) of the participants visited dentist in the last month and most of them visited for scaling (33.7%) followed by restorations (29.7%).

Most of the students personality type was Extraversion (40%) followed by Mixed (18.3%). More than half of the participants reported their self-assessment of oral health as Good (53.3%). The mean caries experience was 2.2±2.4 (range 0-13).

Table 1: Demographic characteristics of study participants.

<table>
<thead>
<tr>
<th></th>
<th>Frequency or Mean</th>
<th>Percentage or Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20.04</td>
<td>1.32</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>177</td>
<td>89.8 %</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>10.2 %</td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st year</td>
<td>41</td>
<td>20.8 %</td>
</tr>
<tr>
<td>2nd year</td>
<td>39</td>
<td>19.8 %</td>
</tr>
<tr>
<td>3rd year</td>
<td>76</td>
<td>38.6 %</td>
</tr>
<tr>
<td>4th year</td>
<td>41</td>
<td>20.8 %</td>
</tr>
<tr>
<td>Previous dental visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>148</td>
<td>75.1 %</td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td>24.9 %</td>
</tr>
<tr>
<td>Reason of visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td>49</td>
<td>24.9 %</td>
</tr>
<tr>
<td>Scaling</td>
<td>50</td>
<td>25.4 %</td>
</tr>
<tr>
<td>Restoration</td>
<td>44</td>
<td>22.3 %</td>
</tr>
<tr>
<td>Extraction</td>
<td>14</td>
<td>7.1 %</td>
</tr>
<tr>
<td>Check-up</td>
<td>10</td>
<td>5.1 %</td>
</tr>
<tr>
<td>Others</td>
<td>30</td>
<td>15.2 %</td>
</tr>
<tr>
<td>Self rating of oral health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>57</td>
<td>44.2 %</td>
</tr>
<tr>
<td>Good</td>
<td>105</td>
<td>53.3 %</td>
</tr>
<tr>
<td>Excellent</td>
<td>5</td>
<td>2.5 %</td>
</tr>
<tr>
<td>Mean Decay</td>
<td>0.68</td>
<td>1.21</td>
</tr>
<tr>
<td>Mean DMFT</td>
<td>2.20</td>
<td>2.40</td>
</tr>
</tbody>
</table>

The original data obtained was coded, categorized, tabulated and subjected to statistical analysis. Standard descriptive statistics were generated. All the analyses were done using SPSS 20 (SPSS Inc, Ill, Chicago, USA). Kolmogorov–Smirnov and Shapiro–Wilk’s test were used to check the distribution of data. Chi square test and Keuskal wallis test were used to find any associations. The p-value ≤ 0.05 was considered as statistically significant.

EPQ-R consists of 48 questions (dichotomous responses as ‘yes’ or ‘no’), 12 questions for each personality traits of extraversion, neuroticism, lie scale and psychotism. The highest score in a single personality type is considered as the person’s trait. The overall self-rating of oral health was assessed on a 4 point scale ranging from poor to excellent.

The second component included 48 questions from Eysenck Personality Questionnaire – Revised (EPQ-R) to assess personality traits (Appendix 1). A question on overall self-rating of oral health was also included. The clinical examination included assessing dental caries experience by DMFT index. The clinical examination was done by one examiner who was calibrated and trained in the Department of Public Health Dentistry. Individuals requiring treatment were referred to department of Public Heath Dentistry for further treatment.

EPQ-R consists of 48 questions (dichotomous responses as ‘yes’ or ‘no’), 12 questions for each personality traits of extraversion, neuroticism, lie scale and psychotism. The highest score in a single personality type is considered as the person’s trait. The overall self-rating of oral health was assessed on a 4 point scale ranging from poor to excellent.

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Type of Personality And Dental Caries, Are They Related? A Cross-Sectional Survey Among Dental Students

<table>
<thead>
<tr>
<th>Gender</th>
<th>Extraversion (n=79)</th>
<th>Neuroticism (n=33)</th>
<th>Lie scale (n=34)</th>
<th>Psychoticism (n=15)</th>
<th>Mixed (n=36)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>67 (34%)</td>
<td>33 (16.8%)</td>
<td>30 (15.2%)</td>
<td>11 (5.6%)</td>
<td>36 (18.3%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Female</td>
<td>12 (6.1%)</td>
<td>0 (0%)</td>
<td>4 (2%)</td>
<td>4 (2%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st year</td>
<td>29 (14.7%)</td>
<td>1 (0.5%)</td>
<td>3 (1.5%)</td>
<td>5 (2.5%)</td>
<td>3 (1.5%)</td>
<td>0.006</td>
</tr>
<tr>
<td>2nd year</td>
<td>15 (7.6%)</td>
<td>5 (2.5%)</td>
<td>11 (5.6%)</td>
<td>1 (0.5%)</td>
<td>7 (3.6%)</td>
<td></td>
</tr>
<tr>
<td>3rd year</td>
<td>23 (11.7%)</td>
<td>21 (10.7%)</td>
<td>8 (4.1%)</td>
<td>6 (3%)</td>
<td>18 (9.1%)</td>
<td></td>
</tr>
<tr>
<td>4th year</td>
<td>12 (6.1%)</td>
<td>6 (3%)</td>
<td>12 (6.1%)</td>
<td>3 (1.5%)</td>
<td>8 (4.1%)</td>
<td></td>
</tr>
<tr>
<td>Previous dental visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58 (39.2%)</td>
<td>21 (14.2%)</td>
<td>27 (18.2%)</td>
<td>13 (8.8%)</td>
<td>29 (19.6%)</td>
<td>0.000</td>
</tr>
<tr>
<td>No</td>
<td>21 (42.9%)</td>
<td>12 (24.5%)</td>
<td>7 (14.3%)</td>
<td>2 (4.1%)</td>
<td>7 (14.3%)</td>
<td></td>
</tr>
<tr>
<td>Self rating of oral health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.668</td>
</tr>
<tr>
<td>Fair</td>
<td>31 (35.6%)</td>
<td>12 (13.8%)</td>
<td>18 (20.7%)</td>
<td>9 (10.3%)</td>
<td>17 (19.5%)</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>45 (42.9%)</td>
<td>20 (19%)</td>
<td>15 (14.3%)</td>
<td>6 (5.7%)</td>
<td>19 (18.1%)</td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>3 (60%)</td>
<td>1 (20%)</td>
<td>1 (20%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Association of type of personality with gender, year of study, previous dental visit and self rating of oral health

<table>
<thead>
<tr>
<th>Extraversion</th>
<th>Neuroticism</th>
<th>Lie scale</th>
<th>Psychoticism</th>
<th>Mixed</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decay</td>
<td>0.72±1.4</td>
<td>0.55±0.7</td>
<td>0.74±0.9</td>
<td>0.47±0.61</td>
<td>0.72±1.5</td>
</tr>
<tr>
<td>DMFT</td>
<td>2.33±2.4</td>
<td>2.06±2.1</td>
<td>2.97±2.7</td>
<td>1.33±1.1</td>
<td>1.69±2.5</td>
</tr>
</tbody>
</table>

Table 3: Association of personality type with dental caries and caries experience

DISCUSSION

Dental caries is a major, universally recognised oral health problem. Untreated dental caries can cause sensitivity and pain which can affect the normal functions. The treatment of dental caries ranges from simple restoration to extraction of the affected teeth. In a study done by Appukuttan et al11, reported that extraction and drilling of tooth provoked more anxiety. This can lead to delay in seeking treatment, irregular dental attendance or complete avoidance. The response to a situation can be affected by the type of personality. A study conducted among engineering students in Bangalore reported no correlation of personality type with dental anxiety12 while Halonen H et al13, reported negative correlation with dental anxiety among extroverts and positive correlation with neuroticism in Finnish university students. Kruger et al14, reported that some personality types are inadequate in handling stress and depression and indirectly affect their dental caries experience.

The individual differences in health behaviours can be explained by personality traits. Psychoticism, neuroticism, anxiety and hostility have been related to detrimental health behaviours, whereas conscientiousness, agreeableness, optimism and self-efficacy have been reported to predict protective health behaviours. A study conducted in Karnataka reported no significant difference in prevalence of caries between Type A and Type B types of personality which is in accordance with the results of this study15.

Thomson et al16, in a prospective study, reported a higher risk of having dental caries in people with negative emotionality as compared to people with complacent emotionality and concluded that personality should be considered as a risk factor for dental caries and similar relation was reported by Manhold and Rosenberg17 that personality characteristics like objectivity, agreeableness and cooperativeness were co-related to dental caries.

Many questionnaires like “Meyer Brigg’s Questionnaire”, “Multi-Dimensional Personality Questionnaire (MDP)”, “Carl Jung Typology Test” and “Tri-Dimensional Personality Questionnaire” are available to assess type of personality. In this study the Eysenck Personality Questionnaire – Revised (EPQ-R) was used which only
takes approximately 10 minutes to complete and can be used in population above 18 years of age. Use of different types of personality questionnaires to define the different personalities makes the comparisons difficult across studies.

To measure the prevalence of dental caries, the DMFT index was used as this is a standard index. DMFT is widely used in majority of epidemiological studies and is also recommended by World Health Organisation (WHO). This makes easier to compare the findings of our study with others.

In this study, previous dental visit showed no significant relation to personality type may be because the experience of the visit is of more importance which affects the attitude towards dentistry.

Limitations in the present study could be selection of participants and higher proportion of female participants. The cross sectional study design can also be considered as a limitation as directionality cannot be assessed. Previous experience of dental visit and also reason for visit should be considered as one of the risk factors that can affect dental caries. Chance of Social desirability bias in survey can affect the results. Hence future studies need to be conducted among wider general population with better tools to determine whether there is an association between types of personality and various dental health problems.

The knowledge of various risk factors of oral diseases is important for the dental practice to be successful. By understanding various aspects that may affect participants’ dental attitudes and behaviours, health professionals can improve patients’ compliance and overall quality of life.

CONCLUSION

The type of personality trait and dental caries in this study did not show any significant association. However, gender and year of study showed a significant relation with type of personality.

Conflict of Interest: The authors have none to declare.

Acknowledgments

We would like to thank the Principal of dental collage, Head, Department of Biostatistics, Prof and Head, Department of Public Health Dentistry and participants for their cooperation and support.

REFERENCES


CASE REPORT

Amrita Journal of Medicine

Seek and Ye Shall Find
S Sudhip Krishnan*, Unnikrishnan Menon*

Corresponding Author: Unnikrishnan Menon, Associate Professor, Dept. of ENT, AIMS, Kochi.

INTRODUCTION

Hoarseness (or dysphonia) affects nearly one third of the adult population at some point. It is a symptom and not a diagnosis in itself. Affected patients usually consult a variety of doctors ranging from primary care physicians to ENT specialists. There are set protocols for the evaluation and investigation of such cases, which usually yield the right diagnosis. However, there can be instances when some underlying uncommon diagnosis is missed because of the common symptom. The present case report highlights such an instance.

The title is a taken from Dan Brown’s Inferno which is apt for such cases in medicine. It exemplifies the importance of systematic analysis of the clinical features, and judicious use of investigations in reaching a correct diagnosis.

CASE REPORT

A 57 years old male, a clerk in a private firm came to ENT OPD seeking voice restoration procedure as per advice from elsewhere. Initial history-taking revealed that the symptom of hoarseness started about three years prior. He was not a habitual tobacco or alcohol consumer. His job involved frequent telephonic conversations in office. Although this did not categorize him as a professional voice user, he had further use of voice in the form of choir-singing in church, on Sundays. The change in voice was hence noticed early enough, which led to consultation at a nearby hospital. The ENT doctor diagnosed him with left vocal cord paralysis. Protocol imaging was advised; computerised tomography (CT) scan taken at that time, presumably of the neck, was apparently normal. As there was no identifiable primary cause, it was categorised as idiopathic unilateral vocal cord paralysis. He was advised conservative measures, including voice therapy. However, the patient was still unsatisfied with his voice as he was unable to sing in church. So he consulted other ENT specialists all of whom suggested various surgical modalities (Thyroplasty / Injection laryngoplasty) for the correction of his voice. Being not so keen for a surgical option, he ignored the symptom for some time. Then, about 2 months prior, he developed an attack of upper respiratory tract infection with associated breathlessness. He consulted at a nearby hospital and was presumably treated for lower respiratory tract infection. After a course of treatment for the latter, he was advised to consult with ENT Dept here (being a tertiary referral centre).

On examination, the patient was comfortable with no features of respiratory insufficiency. Perceptively, the voice quality was a mixture of breathy and harsh components. The maximum phonation duration (MPD) was only 8 seconds (normal range of 12 – 20). On indirect laryngoscopic examination, the left vocal cord was immobilised in near median position with adequate compensation from the right side. So there was only minimal phonatory gap. Baseline pulmonary function test (PFT) is a part of the protocol for dysphonia cases with poor MPD. Hence, he was referred to the pulmonary medicine department, for the needful. Radiography and auscultation turned out to be normal. PFT was reported as being suggestive of “fixed extra-thoracic obstruction”.

A fresh imaging was planned. Multidetector computed tomography (MDCT) neck and thorax with contrast revealed an unexpected finding. It reported a soft tissue enhancing mass in the tracheo-oesophageal groove with adjacent nodal mass, suggestive of tracheal mass and/or oesophageal carcinoma.

In order to better visualise the mass, a bronchoscopy was done, which revealed an infiltration of tracheal mucosa and polypoidal mass arising from the anterior wall of mid trachea, 2 cm below the vocal cords. A biopsy was also taken along with bronchoscopy and sent for histopathological examination. This came up with yet another surprise – morphologically suggestive of salivary gland neoplasm. The patient was transferred to the Oncology Dept. for further management.

DISCUSSION

Unilateral vocal fold palsy (UVFP) is a not so uncommon condition. Idiopathic has been established as the single most common cause by many studies and in standard texts. An Indian study has placed the incidence at 0.42% of new patients; majority being males in 5th and 6th decades at presentation. Another study from Kerala reported similar findings. The most typical presentation is an acute onset dysphonia, which then usually has an initial fluctuating progress, depending on the affected person’s profession. This is followed by gradual resolution of symptom, over a period of time ranging anywhere from 3 – 9 months. In the present case, the patient had a documented left vocal cord palsy of more than 3 years’ duration. This was the first clinical “red flag”. It was less likely that an idiopathic vocal fold palsy would last so long (although not impossible).

For the idiopathic diagnosis to be established, standard protocol mandates imaging to rule out cause (in the absence of obvious surgical or other traumatic injury).

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This is generally a CT scan, base skull to neck, in case of right VFP, and up to upper mediastinum, in case of left. This is explained on the basis of the intra-thoracic path of the left RLN. Although this patient did undergo the protocol imaging, it was apparently reported to be normal. It can only be assumed that the mass must have been too small and/or not specifically looked for by the radiologist. The “usual suspects” in the case of UVFP are aortic aneurysm, oesophageal and broncho-pulmonary carcinoma, and mediastinal lymph nodes or neoplasms. Here again, the unusual cause seems to have played its part.

The standard modalities of treatment had been prescribed for our patient. These include voice therapy initially, followed by interventional medialization of the laterally placed immobile vocal fold. The reported success rates of the latter are very high6,7,8. Fortunately, or otherwise, this patient did not proceed for surgery!

Over the duration of 3 years, the patient did not develop any other symptom. This can be explained by the slow-growing nature of the salivary gland neoplasm. The first inkling of anything sinister was the breathlessness, which however, came after a reported episode of lower respiratory tract infection. The tumour was starting to make its mark in the form of actual airway obstruction.

Evaluation of hoarseness begins with the perceptive quality of voice itself. A recent onset UVFP would generally produce a breathy voice, representing the leak of air between the non-adducting vocal folds. Gradually, it worsens to harshness as compensatory mechanisms and vocal strain overlap. Our patient had a severe degree of both types. Next invaluable tool is the maximum phonation duration (MPD). This is a requisite, reliable modality in voice evaluation9,10. The patient is asked to take a deep, full breath, and then phonate “aa” and/or “ee”, without straining as s/he lets out the breath. The normal range is anywhere from 12 – 20 seconds, depending on gender and build. An organic lesion at the level of the vocal folds tends to markedly reduce the MPD. However, the other factor that affects MPD is the lung capacity. This brings up the next investigation viz. the pulmonary function test (PFT). This is often prescribed as a baseline test for dysphonia cases. The specific relevance in this case came after the laryngoscopic examination. Indirect laryngoscopy (IDL) examination with the mirror or the rigid scope is the first-line intervention by the ENT doctor. In most cases, this yields adequate information about the laryngeal status and pathology. In a typical early case of UVFP, the IDL would reveal the immobile vocal fold in one of various abducted positions (median, paramedian, intermediate or lateral). So, there would be a gap between the two VFs, as the patient phonates. This is called the phonatory gap. Gradually, over the next few months, this gap starts to reduce or close, either due to returning function of the paralysed VF, or compensatory coverage by the other VF. And, in most cases, the MPD tends to reflect the phonatory gap. Now, in our patient, the IDL showed a compensating RVF, so that the phonatory gap was barely 1-2 mm. This was the second clinical “red flag” – the disproportionately worse MPD.

PFT, followed by the pulmonologist evaluation, gave rise to the inference that there seems to be a fixed extra-thoracic obstruction. In view of relatively benign laryngeal finding and clear lungs, the needle of suspicion now moved to the hitherto hidden areas viz. sublottis and the trachea-bronchial tree. This, then, turned out to be the third “red flag”. This information was passed on to the radiologist who then reported on the fresh CT, with the new diagnosis. As mentioned in the study by Chen HC et al, “the possibility of a neoplasm must be ruled out before VCP is labeled idiopathic”11. Radiological literature has cited the relevance of the CT scan in identifying extralaryngeal causes of VFP12.

The rarity of the final diagnosis would make for a separate article in itself. Although literature search on this aspect did not yield much, there are scattered reports of minor salivary gland neoplasms in the trachea and oesophagus, although none reported VFP as a presenting symptom13,14,15. From the point of view of present discussion, the case report has been concluded here, without going into details of further management.

CONCLUSION

The take home message from this case report is the solution of a tricky case using inferences drawn from specific clinical clues and appropriate investigations, in a stepwise fashion. We suggest that it is a perfect example of how anatomical, physiological and pathological correlations with the associated ‘red flags’ can help clinch the diagnosis. The reader is once again alerted to the highlighted “red flags” which could find parallels in any such case of rare diagnoses in medicine.

REFERENCES


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