Mycobacterium tuberculosis

Vitamin D deficiency in Lumosacral Radiculopathy

Lymphadenopathy in Children

Tuberculosis in Elderly

Vitamin D deficiency in Lumosacral Radiculopathy

Smoking Prevalence Among Male Medical Students
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Reference to an article with 3 or less authors:

Reference to a book:

Reference to a chapter in a book:

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Supporting the health and well-being of Doctors – Is there a need for specialist Doctor’s well-being and support service? Is the scenario different in India - Are Indian Doctors more resilient?

K Valsraj Menon*, D M Vasudevan**, Vishal Marwaha***, Prem Nair*

Corresponding Author: K Valsraj Menon, Additional Medical Superintendent, Senior Consultant Psychiatrist, AIMS, Kochi.

It is well recognised that medical profession has associated stressors and this has a huge impact on the overall well-being of doctors. The literature highlights that there is a high rate of psychological disorders amongst doctors; however help seeking is considerably low. We aim to highlight some of the key findings from literature, the need to raise awareness and support the health and well-being of doctors. The majority of the published literature is focussed on the western health system.

An Australian systematic review on the mental health of doctors suggest that the combination of increasing work pressures, high expectations, difficult working environment and common personality traits like conscientiousness, commitment and obsessiveness can result in high levels of stress and burn out or mental health conditions such as depression or anxiety disorders.

The key findings from the published articles on the psychological health of doctors highlight:
- An increased prevalence of mental ill health in doctors particularly anxiety and depression
- Substance misuse is common and more so in certain specialities that offer easy access to controlled drugs
- Self-medication is more common
- An higher incidence of suicide rates
- The exposure of medical professionals to various risk factors (poor work life balance, ever increasing expectations, demanding work schedule, long working hours, work load and several associated pressures)
- Reluctance of help seeking behaviour despite the awareness due to the concerns of confidentiality and perceptions
- Several barriers faced by medical professionals to seek help for psychological disorders due to the complexities of a doctor becoming a patient (these include stigma, potential impact on career, confidentiality)
- Negative attitude of colleagues towards fellow doctors with psychological difficulties
- Negative impact on patient care, work and family life
- The negative impact across professional, personal and social domains if psychological well-being is affected
- The impact of not seeking help in a timely manner and the vicious cycle due to the above factors

The findings highlight that this is a major concern internationally. In order to address the sensitivity and complexity of doctor becoming a patient some of the western countries have developed specialist services for doctors. The evidence for specialised services is promising from the data and publications. There is growing evidence from the NHS Practitioner Health Programme in UK, a specialised service for doctors. The quantitative and qualitative aspects highlight the fact that specialised services help to address the barriers and break the vicious cycle; enable doctors to seek help early, receive prompt intervention and support.

In the light of the evidence base from western literature it is worth drawing your attention to a small study from India which indicates very low levels of stress and burnout amongst a small cohort of doctors and dentists in North India compared with studies in the west. The finding from the 2008 study, that doctors in a small industrial town in North India are contented and show low levels of burn out, is an interesting point; however this has to be explored further and should be substantiated by having larger samples, different specialities and a comparison of Indian and western medical students.

There is a growing evidence for offering specialised services to support the psychological well-being of doctors and these services have been developed in some of the western countries. As one small Indian study observes the low level of burn out and contentment of doctors in India there is an opportunity for a larger Indian study to ascertain if the doctors and medical students in India are more resilient and if so what are the protective factors that makes the positive difference.

REFERENCES

*Medical Administration, “Dept.of Health System Research.” **Dept.of Rheumatology and Clinical Immunology. AIMS, Amrita Visha Vidhyapeetham, Kochi, India.
INTRODUCTION

Symptomatology and history-taking are the well-known initial steps of the doctor’s approach to a patient. This is then followed by diagnostic tests and/or procedures, followed by appropriate treatment modalities. One could visualize this whole edifice of modern medicine being balanced on two foundations: evidence-based medicine and patient consent and satisfaction. The former aspect forms the bulwark of medical research, whilst the latter (patient satisfaction) may get neglected. This is often due to lack of appropriate tools or tests. Herein lays the role of questionnaires.

The present article is an attempt at a systematic look at the role and relevance of questionnaires in our routine medical practice. The author gives his perspective on the indications, utility and implementation aspects of this tool. It is hoped that this will be a thought-provoker for the readers to consider optimizing the use of questionnaires.

What?

Questionnaires constitute a simple, yet effective, method to gauge various aspects of patient care and management. These can include symptomatology details, perceived handicap, treatment modality choices, overall satisfaction level and quality of life. However, it is the latter that is most often measured using questionnaires. Needless to say, this is because of the essential impreciseness in the concept of “quality of life (QOL)”, which lends itself to a high level of subjectivity. A set of questions with the need for precise answers becomes a round-about way to inject objectivity into this attribute of patient care. And, with ever-increasing choices in the modalities of treatment, often the QOL scores serve as a benchmark for gradation of the former. Thus, it has become an important research tool too.

So, is it the case that only QOL can be measured by questionnaires? Most certainly, no. One way to look at questionnaires would be simply as a formal list of questions (preferably written), which ensures that no point in the relevant topic is missed out (which may unwittingly happen in the routine oral interaction between physician and patient). Seen this way, there can be no end to the variety of roles which a well-prepared and directed questionnaire can be put to.

What, then, are the indications for using questionnaires in medical practice? Let us take a brief look at the when, why and how of their use. The following list of classification and types of questionnaires gives us some idea of the wide spectrum of application.

The above makes it amply clear that questionnaires can be a multi-purpose tool. It is up to all of us in the medical fraternity to take maximal advantage, in the most suitable way.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Target</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>Generic Patient</td>
<td>Full questionnaire Paper (written)</td>
</tr>
<tr>
<td>Therapeutic</td>
<td>Disease-specific Physician Parent / Teacher Likert scale Visual analogue scale Smartphone Datapen</td>
<td></td>
</tr>
</tbody>
</table>
Where?

To begin at the beginning, there is the screening questionnaire. This can be used as a precursor to a more specific questionnaire or management modality. A well-known example is the Patient Health Questionnaire (PHQ-9), a screening questionnaire for depression. The author is presently conducting a study on voice disorders in school teachers with a self-devised screening questionnaire.

Next comes the one to get details of symptoms and perceived difficulties. This can be either as part of routine pre-consultant evaluation (eg. Dizziness questionnaire used in a Vertigo clinic), or research-directed disease-specific. The former may often be institution-specific.

In some conditions, the subjective component (i.e. the perceived problem) is an important aspect of the disease. Therefore, it becomes necessary to measure it objectively. A questionnaire becomes invaluable here. A good example is the voice handicap index (VHI) where a set of 30 questions are used to “measure” the physical, functional and emotional handicap felt by the patient due to his/her voice problem. The resultant score is a required parameter in the reporting of studies on voice pathologies.

Then, there is the post-treatment scenario. Questionnaires can be either a repeat administration of a pre-treatment one, or a separate one for long-term / long-distance follow-up check.

Quite apart from the patient population as the target, there are also questionnaires sent out into the community and amongst physicians. These are generally used to assess the KAP (knowledge, attitude, practice) of the targets towards certain aspects of disease care and management.

How?

Intuitively, one tends to think of a typed set of questions. However, this need not be the only modality. Selecting appropriate options, preference indicated via Likert scale, subjective scoring on a visual analogue scale are all versions of questionnaires. Also, the questions can be administered in oral (interview) form, posted to respondents, or via social media platforms.

One could also classify questionnaires into the pre-existent, validated type and the new, experimental one. In the latter case, validation is necessary. This is a topic in itself. The reader is directed to this Article, one of an excellent series on questionnaire development.

Why and why not? .

A summary of the pros and cons of questionnaires, as listed in an online site for survey software (StatPac).

Advantages:
Cost-efficient, especially mobile and online
Practical
Quick results
Wider reach
No need for high-end personnel
Analysis is easier
User anonymity
Cover all aspects of a topic, without fail
No time pressure, for online or postal type
Disadvantages:
Dishonesty
Lack of conscientious responses
Skipped questions
Differences in understanding and interpretation
Non-subjectivity (feelings / emotions)
Difficult to analyse answers (for open-ended qs.)
Hidden agenda of respondent
Lack of personalization
Accessibility issues (visual, hearing impairment, illiteracy)

Issues

As can be noted from the above list, many factors can be dampeners on the effectiveness of questionnaires. Undoubtedly, the most problematic one is the disinterested or unmotivated respondent. An interesting study on this issue introduces the term “satisficing”, which “occurs when respondents only give a satisfactory answer instead of spending the mental effort necessary to give optimal answers to question after question”.

Although there are no dedicated Indian studies, it has been a general observation amongst clinicians that our patient/s have a rather lackadaisical attitude towards answering questionnaires. This becomes an issue especially whilst using a standard, validated version which may be too long, or with complex questions. Even if adequately translated into the vernacular, the chance of careless answering becomes quite high. This is to be seen as a challenge whereby we could set out to devise new questionnaires with local applicability. This author has made one such effort, along with the neurologist, to create a modified version of a screening questionnaire to detect swallowing difficulties in Parkinson’s disease patients. The validation had been published, and further studies with the questionnaire are ongoing.

Administration

A written questionnaire given to the patient and/or attendant, in the Clinic, is usually the best option. The only consideration here is time management. The peri-treatment waiting period in the out-patient setting can be utilized. Of course, the other types, such as telephonic, postal, social media administration, may be necessitated as and when needed.
Checklist

It would be useful to keep in mind the following aspects before preparing to administer a questionnaire. Some of these are born out of personal experience. There can always be more points.

1. Counselling about the need for the specific questionnaire
2. Dedicated personnel for administering and collecting
3. Ensuring adequate hardware support for answering
4. Checking accessibility issues, including vernacular version
5. Explanation, as needed, of the questions
6. Filing, documentation and/or electronic records entry
7. Pilot study, where indicated

The latter is a must in case of a new questionnaire being tried out. It may also be relevant for an existing one, but being used for the first time in a given setting or population. The following reasons have been cited for conducting a pilot questionnaire.

1. Check that respondents understand the terminology used in the questionnaire.
2. Check that emotive questions have not been used as they make people defensive and could invalidate their answers.
3. Check that leading questions have not been used as they could bias the respondent’s answer.
4. Ensure the questionnaire can be completed in an appropriate time frame (i.e., it’s not too long).

Future considerations

So, what does all this amount to? For one, we, as clinicians, should get more questionnaire-savvy. Quite a few postgraduate theses make use of questionnaires; it is to be hoped that find continued usage in clinical practice. Secondly, let there be more research involving development of relevant questionnaires. And thirdly, a thought on doing a qualitative study on patient groups, regarding their knowledge, attitude and practice (KAP) towards responding to written questionnaires. At least one such study concluded that patients prefer completing the answers in the clinic itself, but were at variance with clinicians as regards the most appropriate questionnaire.

REFERENCES

Lymphadenopathy in children

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ABSTRACT

Lymphadenopathy (LAP) is one of the common clinical conditions in children across the world. This is due to the presence of large lymphoid mass and fast lymphocytic response to allergens/infections in children. LAP is defined as enlargement of cervical and axillary lymph nodes more than 1 cm and that of inguinal nodes >1.5cm in diameter. LAP is most prevalent in first decades of life due to their constant exposure to new allergens and repeated infections. LAP is significant since it may be the first and sometimes the only indication of the underlying disease. The major concern in LAP is the association with malignancy. Therefore LAP needs active investigation, early diagnosis and early treatment.

Anatomy

Lymphatic vessels and lymphoid organs together constitute the lymphatic system. Interstitial fluid is carried back to the circulating blood through lymphatic vessels. An ultra filtrate of blood is the lymph which is collected through the lymphatic capillaries. Brain and heart are devoid of lymphatic capillaries. By the milking action of skeletal muscles and peristalsis of lymphatic capillaries lymph moves upwards and drains into larger lymphatic vessels and eventually into the right lymphatic and thoracic duct. Lymphocytes and cells which are responsible for the body’s immunity comprise lymphoid organs. There are primary and secondary lymphoid organs. Primary lymphoid organs are made up of bone marrow and thymus. B and T lymphocytes are generated from primary lymphoid organs. The secondary lymphoid organs are made up of lymph nodes, spleen; mucosa associated lymphoid tissue (MALT) which includes tonsils, appendix, solitary lymphoid nodules and Peyer's patches of ileum.

Human body has approximately 600 lymph nodes present throughout the body. Lymph nodes are bean shaped, encapsulated by connective tissue nodes which act as filters for the lymph. Lymph node consists of a cortex (B cell activation area), paracortex (T cell dependent area) and medulla (sinuses lined by macrophages). Before getting back into the blood stream, lymph passes through at least one lymph node in the body. Afferent lymphatics carry lymph into the convex surface of lymph node. Antigens, partly destroyed microorganism and cytokines are present in afferent lymphatics. Through the hilum of lymph node efferent lymphatics and veins exit. Efferent lymphatics are rich in newly synthesized antibodies. Lymph nodes contain lymphocytes, macrophages, plasma cells, follicular cells and reticular cells. Proliferation of lymphocytes, maturation of B cells into plasma cells happen in lymph nodes.

Normal lymph node size is 0.5 cm (epitrochlear), 1 cm (axillary & cervical) and 1.5 cm (inguinal) in diameter according to the site of the node. Several studies have shown that up to one half of healthy neonates, infants and younger children have enlarged palpable lymph nodes. This is because these categories of children are constantly exposed to newer antigens.

Understanding the anatomy of lymph node drainage will help us to localise the pathologic lesion during lymph node enlargement. The location and drainage of various lymph nodes are shown in Fig 1, 2, 3 & 4.

Pathology

LAP is due to the response of antigenic stimulation by cellular elements to a localised or generalised pathology. When LAP is restricted to single node or their drainage area it is called as Localised LAP. It can be cervical, axillary, inguinal, supratrochlear, occipital etc. When two or more non-contiguous lymph node regions with enlarged nodes is seen it is called as Generalised lymph node enlargement. Causes for generalised LAP are systemic diseases due to infectious agents, malignancies, autoimmune disease, lipid storage disease, drug reactions and miscellaneous pathologies. The distribution of different conditions with LAP is given in Fig 5.

Epidemiology

LAP is one among the most common clinical problems seen in children all over the world. In developed nations the incidence of palpable LAP varies from 38-45%. To differentiate whether LAP is due to a normal response to repeated infections or due to a serious underlying disease is quite difficult.

In tropical countries Tuberculosis is the commonest benign cause of LAP in adults and children. In TB patients HIV assessment has to be done since it increases the occurrence of extra pulmonary TB in more than 50% of patients. The viral infection, Infectious mononucleosis occurring in all age groups is more frequent among adolescents. More than 90% of adults across the globe are seropositive and only 20-30% become clinically ill.
Lymph Nodes

Superficial groups
- Cervical
- Axillary
- Inguinal

Deep groups
- Tracheobronchial
- Aortic
- Iliac

Fig 1: Location of lymph nodes

Preauricular nodes:
- Drain scalp, skin

Differential diagnosis:
- Staphylococcal infection, mycobacterial infection

Malignancies:
- Skin nevi, lymphomas, head and neck squamous cell carcinoma

Posterior cervical nodes:
- Drain scalp, neck, upper thoracic skin

Differential diagnosis:
- Same as preauricular nodes

Supraclavicular nodes:
- Drain gastrointestinal tract, genitourinary tract, pulmonary

Differential diagnosis:
- Abdominal, thoracic neoplasms, thyroid/hypopharyngeal disease, mycobacterial/fungal infections

Submandibular nodes:
- Drain oral cavity

Differential diagnosis:
- Mononucleosis, upper respiratory viral/bacterial infection, mycobacterial infection, toxoplasmosis, cytomegalovirus, dental disease, rubella

Malignancies:
- Squamous cell carcinoma of the head and neck, lymphomas, leukemias

Anterior cervical nodes:
- Drain larynx, tongue, oropharynx, anterior neck

Differential diagnosis:
- Same as submandibular nodes

Fig 2: Drainage of Head and Neck lymph nodes
Fig 3: Drainage of lymph nodes in hand

Infradavicular nodes:
- Highly suggestive for non-Hodgkin’s lymphoma

Axillary nodes:
- Drain breast, upper extremity, thoracic wall
- Differential diagnosis:
  - Skin infections, trauma, cutaneous diseases, tuberculosis, sporotrichosis, sarcoidosis, syphilis, leprosy, brucellosis, leishmaniasis
  - Malignancies:
    - Breast adenocarcinoma, skin neoplasms, lymphomas, leukemias, soft tissue/Kaposi’s sarcoma

Epitrochlear nodes:
- Drain ulnar forearm, hand
- Differential diagnosis:
  - Skin infections, lymphoma, and skin malignancies

Fig 4: Drainage of lymph nodes in the leg

Horizontal node group

Vertical node group

These groups drain lower abdomen, external genitalia (skin), anal canal, lower 1/3 of vagina, lower extremity

Differential diagnosis:
- Benign reactive lymphadenopathy, sexually transmitted diseases, skin infections

Malignancies:
- Lymphomas, squamous cell carcinoma of penis, vulva, and anus; skin neoplasms; soft tissue/Kaposi’s sarcoma
In 50% of nodes with LAP taken for biopsy the cause is reactive hyperplasia. The type of infection causing LAP in developed nations are entirely different from that of developing nations. In developed countries infectious mononucleosis and cytomegalovirus are common etiologies for LAP, whereas in developing nations tuberculosis, typhoid fever, leishmaniasis, trypanosomiasis, schistosomiasis, filariasis and fungal infections are the common causes which are rarely seen in developed nations. In developed countries mortality and serious morbidity due to LAP are unusual with common infectious diseases, whereas as malignancies like leukemia, lymphoma, neuroblastoma, autoimmune disorders such as juvenile rheumatoid arthritis, systemic lupus erythematosus, histiocytosis and storage disorders contribute significant morbidity and mortality. Race and sex has no direct influence in LAP. In certain ethnic groups there is a predilection for rare causes of LAP like sarcoidosis in Africans, Kikuchi-Fujimori disease in Asians (Japanese) etc.

**Demographics**

Geographical differences are seen in the epidemiology of LAP. In developed nations chronic granulomatous condition like atypical Mycobacterial infection and cat scratch disease are the common causes for LAP. In developing nations Mycobacterium tuberculosis is the commonest cause. The various risk factors like environmental hygiene, genetic susceptibility towards a disease, exposure to pathogens, immune response etc are different in various geographical regions.

**Aetiology**

The causes of LAP are categorized as

- immune response to infective agents like bacteria, virus, fungus
- inflammatory cells in infections which involves the lymph nodes
- infiltration of neoplastic cells carried to nodes by lymphatics and blood
- localized neoplastic proliferation of lymphocytes/macrophages
- infiltration of macrophages filled with metabolic deposits in conditions like storage disorders.

**Evaluation of lymph node enlargement**

Lymphadenopathy evaluation begins with a detailed history and physical examination to reach differential diagnosis. For confirmation of the diagnosis further investigations such as laboratory, radiologic and biopsy tests are needed. Lymph node enlargement is due to infection, antigenic stimulation (cellular hyperplasia, lymphocyte infiltration, tissue edema) and infiltration by malignant tumour cells.
(1) **Age**

Age is one among the determining factors to suggest the probable cause of lymph node enlargement.

Neonates- congenital infections like Toxoplasma, Cytomegalovirus (CMV). Children < 5 years old – infections
Adolescents- infections, can expect chances of malignancy also.

<table>
<thead>
<tr>
<th>Type of neoplasia</th>
<th>No. of cases</th>
<th>%</th>
<th>Mean age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphoma</td>
<td>108</td>
<td>69</td>
<td>10</td>
</tr>
<tr>
<td>(Hodgkin’s disease, Non-Hodgkin’s lymphoma)</td>
<td>53</td>
<td>49</td>
<td>11.6</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>51</td>
<td>10.1</td>
</tr>
<tr>
<td>Head and neck tumors</td>
<td>24</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Distant metastases</td>
<td>11</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Leukemia</td>
<td>10</td>
<td>6</td>
<td>11.5</td>
</tr>
<tr>
<td>Kaposi’s sarcoma</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>154</td>
<td>100</td>
<td>8.5</td>
</tr>
</tbody>
</table>

Table 1: Neoplasia in patients with cervical lymphadenopathy

(2) **History**

The questions such as when did the swelling arise, is it started in association with an infection, how much the swelling grow in a particular period, is there any other swelling seen, what are the systemic symptoms(loss of weight, sweating at night, bone pain) associated with the occurrence of swelling etc.

There are other swellings which can be misinterpreted as lymph node swellings. The conditions are given in Table 2.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystic hygroma (lymphangioma)</td>
<td>A compressible painless soft mass that transilluminates; may increase in size during upper respiratory infections</td>
<td>Supraclavicular and posterior to the sternocleidomastoid on the left side, but may extend to other areas such as the floor of the mouth and axilla</td>
</tr>
<tr>
<td>Branchial cleft cyst</td>
<td>Recurrent swelling that may be infected; may have a sinus or pit</td>
<td>Lateral neck with sinus along anterior border of the lower 2/3 of the sternocleidomastoid</td>
</tr>
<tr>
<td>Thyroglossal duct cyst</td>
<td>May present with infection and moves with tongue protrusion and swallowing</td>
<td>Midline at the level of the thyrohyoid membrane; communicates with the base of the tongue. Occasionally may be felt lateral to the midline</td>
</tr>
<tr>
<td>Cervical rib</td>
<td>Hard, bony feel</td>
<td>Supraclavicular</td>
</tr>
<tr>
<td>Thyroid nodule</td>
<td>Painless firm to hard</td>
<td>Midline in thyroid area</td>
</tr>
<tr>
<td>Sternocleidomastoid fibroma</td>
<td>Soft mass in the sternocleidomastoid, torticollis with chin pointing to the opposite side of hematoma</td>
<td>Inferior portion of sternocleidomastoid</td>
</tr>
<tr>
<td>Epidermoid cyst</td>
<td>Superficial, smooth</td>
<td>Suprasternal</td>
</tr>
</tbody>
</table>

Table 2: Conditions commonly misinterpreted as lymph node swellings
Lymphadenopathy in children

(3) Physical Examination

Anthropometric measurements, Pallor, vital signs are to be examined. Poor weight gain with lymphadenopathy can be found in diseases like TB, HIV, lymphoma etc.

Lymph node and lymphatic organ examination

(a) Site: To evaluate an enlarged lymph node, location of the lymph node is very important. For example viral upper respiratory infections cause cervical lymph node enlargement, Supraclavicular lymphadenopathy in malignancy, tuberculosis, lymphoma, atypical mycobacterial infections, sarcoidosis of mediastinum etc. Drainage area of the lymph node affected has to be examined.

(b) Size: Size of lymph nodes to be recorded in the initial evaluation and prior to the initiation of treatment. Lymph node size greater than 1 cm (axillary & cervical) and 1.5 cm (inguinal) in diameter are considered as dangerous. Lymph nodes > 2 cm are more dangerous

(c) Number of lymph nodes with enlargement

(d) Consistency (soft/cystic/rubbery/hard) of enlarged lymph node

(e) Fluctuance

(f) Tenderness

(g) Mobility

(h) Presence of matting

Primary focus of infection, other areas of potential lymph node enlargement, drainage area, Hepato-splenomegaly etc should be evaluated. Swelling of lymph nodes with pain, erythema, edema and tenderness is seen in lymphadenitis.

(4) Time of onset

Time of onset and duration of lymph node enlargement are important features to be noted. An acute enlargement usually represents an acute viral or bacterial infection. Chronic lymphadenopathy represents the duration of lymphadenopathy as greater than 4 weeks of duration. Chronic infection or malignant change could be a cause for chronic lymphadenopathy. Infectious lesions in the drainage area helps to identify the focus of infection.

(5) Symptoms

Conditions such as fever, rash, generalized pain, joint pain with swelling, petechiae, weight loss, failure to thrive, night sweats, chronic cough, fatigue, red oral mucosa, peeling of fingers, eczema etc can cause lymphadenopathy. Clinical symptoms like sore throat, nasal congestion, red eyes with discharge, oral ulcers, dental caries, gingival swelling etc has to be accounted in patients with cervical lymphadenopathy. Respiratory and pharyngeal compromise symptoms like drooling, stridor, difficulty in breathing needs immediate care. Recurrent infections with lymphadenopathy point towards chronic granulomatous disease. Zoonoses cause lymphadenopathy. Medicines like penicillin, cephalosporin, phenytoin, carbamazepine can cause generalized lymphadenopathy. In an unimmunized child lymphadenopathy is seen in vaccine preventable diseases like measles, rubella, diphtheria etc.

(6) Differential Diagnosis of Lymph Node Enlargement

Table 3: Sites of localized lymphadenopathy and differential diagnosis

(7) Diagnostic methods

If there is an acute localized lymphadenopathy, focus of infection not identified and suspect as bacterial infection, antibiotics (7-10 days) can be given before an extensive evaluation. The chosen antibiotic should cover for both Staphylococcus and group A Streptococcus. If the lymph node is not regressing laboratory evaluation and imaging studies are needed.

(A) Laboratory evaluation

- Complete blood cell count
  - Neutrophilic leukocytosis - Acute bacterial infection.
  - Lymphocytic leukocytosis - EBV Infection.
  - Neutrophilic leukocytosis + blasts on peripheral smear - Leukemia.
  - Leukopenia + decreased Haemoglobin & platelet - bone marrow involvement with malignancy.
  - Lymphopenia - HIV infection / congenital immunodeficiency disorder.

- Lactate dehydrogenase & Uric acid - to screen rapid cell turnover in malignancy.
- Elevated liver enzymes - Liver involvement in systemic infection/infiltrative process.
- Serology - EBV, HIV, CMV, parvovirus infection.
- Purified protein derivative (PPD) test / Interferon-gamma release assay - screening Mycobacterial infection.
- Specific atypical mycobacterial antigen - Atypical mycobacterial lymphadenitis.

(B) Radiologic evaluation

(1) Chest X ray

- chronic localized and generalized lymphadenopathy.
- Mediastinal widening in chest X-ray - Hodgkin lymphoma.
- Hilar lymph node enlargement & calcification - TB / histoplasmosis.

(2) Radiographs of neck

- To evaluate the extent of lymph node involvement and retropharyngeal space.
<table>
<thead>
<tr>
<th>Site</th>
<th>Differential diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical</td>
<td>Oropharyngeal infection (viral, group A streptococcal, staphylococcal)</td>
</tr>
<tr>
<td></td>
<td>Scalp infection</td>
</tr>
<tr>
<td></td>
<td>Mycobacterial lymphadenitis (tuberculosis and non-tuberculous mycobacteria)</td>
</tr>
<tr>
<td></td>
<td>Viral infection (EBV, CMV, HHV-6)</td>
</tr>
<tr>
<td></td>
<td>Cat scratch disease</td>
</tr>
<tr>
<td></td>
<td>Toxoplasmosis</td>
</tr>
<tr>
<td></td>
<td>Kawasaki disease</td>
</tr>
<tr>
<td></td>
<td>Thyroid disease</td>
</tr>
<tr>
<td></td>
<td>Kikuchi disease</td>
</tr>
<tr>
<td></td>
<td>Sinus histiocytosis</td>
</tr>
<tr>
<td></td>
<td>Autoimmune lymphoproliferative disease</td>
</tr>
<tr>
<td>Anterior auricular</td>
<td>Conjunctivitis</td>
</tr>
<tr>
<td></td>
<td>Other eye infection</td>
</tr>
<tr>
<td></td>
<td>Oculoglandular tularemia</td>
</tr>
<tr>
<td></td>
<td>Cat scratch disease</td>
</tr>
<tr>
<td></td>
<td>Facial cellulitis</td>
</tr>
<tr>
<td></td>
<td>Otitis media</td>
</tr>
<tr>
<td></td>
<td>Viral infection (especially rubella, parvovirus)</td>
</tr>
<tr>
<td>Supraclavicular</td>
<td>Malignancy or infection in the mediastinum (right)</td>
</tr>
<tr>
<td></td>
<td>Metastatic malignancy from the abdomen (left)</td>
</tr>
<tr>
<td></td>
<td>Lymphoma</td>
</tr>
<tr>
<td></td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Epitrochlear</td>
<td>Hand infection, arm infection</td>
</tr>
<tr>
<td></td>
<td>Cat scratch disease</td>
</tr>
<tr>
<td></td>
<td>Lymphoma</td>
</tr>
<tr>
<td></td>
<td>Sarcoidosis</td>
</tr>
<tr>
<td></td>
<td>Syphilis</td>
</tr>
<tr>
<td>Inguinal</td>
<td>Urinary tract infection</td>
</tr>
<tr>
<td></td>
<td>Venereal disease (especially syphilis or lymphogranuloma venereum)</td>
</tr>
<tr>
<td></td>
<td>Other perineal infections</td>
</tr>
<tr>
<td></td>
<td>Lower extremity suppurative infection</td>
</tr>
<tr>
<td></td>
<td>Plague</td>
</tr>
<tr>
<td>Hilar (not palpable, found on chest radiograph or CT)</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td></td>
<td>Histoplasmosis</td>
</tr>
<tr>
<td></td>
<td>Blastomycosis</td>
</tr>
<tr>
<td></td>
<td>Coccidioidomycosis</td>
</tr>
<tr>
<td></td>
<td>Leukemia/lymphoma</td>
</tr>
<tr>
<td></td>
<td>Hodgkin disease</td>
</tr>
<tr>
<td></td>
<td>Metastatic malignancy</td>
</tr>
<tr>
<td></td>
<td>Sarcoidosis</td>
</tr>
<tr>
<td></td>
<td>Castleman disease</td>
</tr>
<tr>
<td>Axillary</td>
<td>Cat scratch disease</td>
</tr>
<tr>
<td></td>
<td>Arm or chest wall infection</td>
</tr>
<tr>
<td></td>
<td>Malignancy of chest wall</td>
</tr>
<tr>
<td></td>
<td>Leukemia/lymphoma</td>
</tr>
<tr>
<td></td>
<td>Brucellosis</td>
</tr>
<tr>
<td>Abdominal</td>
<td>Malignancies</td>
</tr>
<tr>
<td></td>
<td>Mesenteric adenitis (measles, tuberculosis, Yersinia, group A Streptococcus)</td>
</tr>
</tbody>
</table>

Table 3 :Sites of localized lymphadenopathy and differential diagnosis
### Table 4: Differential Diagnosis of Systemic Generalized Lymphadenopathy

<table>
<thead>
<tr>
<th>Infant</th>
<th>Child</th>
<th>Adolescent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>Viral infection</td>
<td>Viral infection</td>
</tr>
<tr>
<td>Toxoplasmosis</td>
<td>EBV</td>
<td>EBV</td>
</tr>
<tr>
<td>CMV</td>
<td>CMV</td>
<td>CMV</td>
</tr>
<tr>
<td>HIV</td>
<td>HIV</td>
<td>HIV</td>
</tr>
<tr>
<td>Viral infection</td>
<td>Toxoplasmosis</td>
<td>Toxoplasmosis</td>
</tr>
<tr>
<td>EBV</td>
<td>Syphilis</td>
<td>Syphilis</td>
</tr>
<tr>
<td>CMV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rare causes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chagas disease (congenital)</td>
<td>Serum sickness</td>
<td>Serum sickness</td>
</tr>
<tr>
<td>Congenital leukemia</td>
<td>SLE, JRA</td>
<td>SLE, JRA</td>
</tr>
<tr>
<td>Congenital tuberculosis</td>
<td>Leukemia/lymphoma</td>
<td>Leukemia/lymphoma/Hodgkin disease</td>
</tr>
<tr>
<td>Reticuloendotheliosis</td>
<td>Tuberculosis</td>
<td>Lymphoproliferative disease</td>
</tr>
<tr>
<td>Lymphoproliferative disease</td>
<td>Measles</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Metabolic storage disease</td>
<td>Sarcoïdosis</td>
<td>Histoplasmosis</td>
</tr>
<tr>
<td>Histiocytic disorders</td>
<td>Fungal infection</td>
<td>Sarcoidosis</td>
</tr>
<tr>
<td></td>
<td>Plague</td>
<td>Fungal infection</td>
</tr>
<tr>
<td></td>
<td>Langerhans cell</td>
<td>Plague</td>
</tr>
<tr>
<td></td>
<td>histiocytoïs</td>
<td>Drug reaction</td>
</tr>
<tr>
<td></td>
<td>Chronic granulomatous disease</td>
<td>Castleman disease</td>
</tr>
<tr>
<td></td>
<td>Sinus histiocytoïs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drug reaction</td>
<td></td>
</tr>
</tbody>
</table>

#### (3) Ultrasonography
- To look for hypoechoic suppurative center of a lymph node.
- More specific and less sensitive than CT for diagnosis of abscess.
- Color Doppler imaging- increased blood flow pattern of inflamed nodes.
- Kawasaki disease- Lymph nodes show cluster of grapes pattern.

#### (4) Computed tomography
- Needed when more anatomical details are required, before surgical procedures, infection in deep neck space, retropharyngeal abscess.

#### (C) Fine needle aspiration cytology (FNAC)
1. Children need sedation/anaesthesia for the procedure.
2. Limited therapeutic and diagnostic benefits.
3. High false negative rate.
4. Inadequate architectural detail.
5. Chance for sinus tract formation is more.
6. In suspected tuberculous lymphadenitis rapid and definite diagnosis can be achieved.

#### (D) Fine needle aspiration biopsy (FNAB) and sampling
Indicated in conditions such as
1. when there is no response to antibiotic therapy in 4-6 weeks duration (lymph node size more than 2 cms).
2. size of the node is increasing rapidly.
3. hard, matted node in posterior triangle supraclavicular region of neck.
4. difficulty in diagnosis- In suspicion of early stages of malignant conditions, specialised tests like immunostaining, flow cytometry etc have to be in conjunction for conclusive results.

#### (E) Excisional biopsy
2. Minimal risk to children.
3. Assess gland architecture and cytological features making early diagnosis more accurate.
4. Confirm malignancy/granulomatous lesion of TB or Sarcoid.
5. Early excisional biopsy needed in suspicion of malignancy.
6. The largest accessible node has to be biopsied.
7. Should be the end point of all cases of LAP where a definite diagnosis is inconclusive.
When to do excisional biopsy

<table>
<thead>
<tr>
<th>Size</th>
<th>Location</th>
<th>Consistency</th>
<th>Associated features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than 2 cm</td>
<td>Supraclavicular lymph</td>
<td>Hard</td>
<td>Abnormal chest radiograph suggestive of lymphoma. Fever</td>
</tr>
<tr>
<td>Increasing over 2 weeks</td>
<td>node</td>
<td>Mattted</td>
<td>Weight loss</td>
</tr>
<tr>
<td>No decrease in size of node</td>
<td></td>
<td>Rubbery</td>
<td>Hepatosplenomegaly</td>
</tr>
<tr>
<td>after 4 weeks</td>
<td></td>
<td></td>
<td>blood disorders, lymphadenopathy</td>
</tr>
</tbody>
</table>

(F) CBNATT (Cartridge based nucleic acid amplification technique) of the lymph node is the new modality of investigation to rule out TB lymphadenopathy.

Treatment

The treatment of lymphadenopathy is based on the etiology. Glucocorticoid therapy has to be avoided since that will mask/delay the diagnosis of leukemia and lymphomas. Patients who have received glucocorticoids will become ineligible for some treatment protocols for leukemia and lymphoma. In lymphadenitis treatment methods are expectant management, antimicrobial therapy, chemotherapy and radiation depending on the cause of the disease.

For bilateral cervical lymphadenitis with node size < 3 cm, non erythematous and no tenderness should be observed only without any further evaluation/treatment. Unilateral LAP with node size >2 to 3 cm and no systemic symptoms, with erythema and tenderness should be empirically treated with antibiotics. The antibiotic should have coverage for Staph aureus and group A streptococcus for a period of 10 days (Amoxicillin/clavulnate, Cephalexin, Azithromycin, Clindamycin). If there is a supraclavicular node with size > 2cm, for a period of 2 weeks, no decrease in size after 4-6 weeks, firm or rubbery in consistency, presence of ulceration, systemic symptoms like fever, weight loss, hepatosplenomegaly and failure to respond to antibiotic therapy malignancy has to be ruled out. Cervical lymphadenitis with abscess need fine needle aspiration/surgical excision.

In cases with tuberculosis rifampicin and isoniazid are given.

In cases of nontuberculous mycobacterial adenitis surgical management has to be done. Patients with viral etiology have to be treated by expectant management.

Conditions like Kawasaki disease, Systemic lupus erythematosus (SLE), Langerhans cell histiocytosis require immunosuppressants.

REFERENCE

2. National Guidelines on diagnosis and treatment of Pediatric Tuberculosis
Experiences From Active Case Finding for TB in Elderly Homes in Kochi Corporation, Kerala, India


ABSTRACT

Introduction: Increased risks of TB transmission were reported in the elderly due to longer delay of diagnosis and treatment especially in long-term care facilities for the elderly where densely populated individuals with diverse comorbidities have a greater risk.

Objectives: To do active case finding among the inmates of old age homes in Kochi corporation area.

Methods: The screening program was done under stewardship of Kochi Municipal Corporation and with official support of District TB Control Office and District Social Justice Department. Technical and implementation support was provided by the Amrita School of Medicine. Medical team included a pulmonologist, lady medical officer, medical interns, social workers and field workers from Amrita School of Medicine. Examination including general examination, filling a history cum clinical sheet, screening for diabetes using GRBS, hypertension screening, screening for chronic respiratory diseases, haemoglobin estimation and screening for TB for all inmates.

Results: Of the 157 elderly inmates screened, 46 had symptoms suggestive of TB, 25 were tested for TB but none turned out to be positive for the test. Of them, 24.2% of inmates had BMI <18.5.

Conclusion: Adopting accurate and rapid diagnostic tools, regionally appropriate evidence-informed guidelines and establishing a system in place for continuous surveillance will determine the effectiveness of the intervention. Vulnerabilities for TB are high in old age homes and steps need to be taken to reduce those vulnerabilities.

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INTRODUCTION

TB remains as a public health scourge, a health security threat and a development challenge. Goal 3 of the Sustainable Development Goals (SDGs) set by the United Nations has one of its targets to end the global TB epidemic by 2030. TB elimination has been linked to address other social and economic development goals including ending poverty, hunger and ensuring education, gender equality and social justice. Integral to achieve this target, World Health Organisation has launched the End TB strategy with targets to reduce TB deaths by 95% and to cut new cases by 90% between 2015 and 2035, and to ensure that no family is burdened with catastrophic expenses due to TB.

TB continues to be India’s severest health crisis killing more than 1,400 every day. Contributing to about 25% of TB cases globally, the rate of decline in TB is too slow in the country to meet the 2030 Sustainable Development Goals (SDG) and 2035 End TB targets. Responding to the calls on governments to achieve SDGs and adapt and implement the End TB strategy, Government of India has formulated National Strategic Plan for TB Elimination by 2025 with high-level commitment and financing. Enhanced efforts and integrated strategies are much needed, especially for vulnerable and high-risk population for TB.

Despite its large efforts to find out cases, Kerala is the state reporting lowest number of TB cases in India. TB notification started falling by 4% annually in the state since 2009. The state has clear indicators of a lower TB transmission including skewing of age specific TB notification. Age specific notification of incident TB cases while declined in younger age groups has increased by 10% in elderly over a decade in the state making elderly a high-risk population for TB.

Older adults’ vulnerability to TB has long been recognised. Ageing itself, male predominance, smoking, malnutrition, and BMI <18.5 are the risk factors for developing TB in the elderly. Elderly TB patients have more risks for chronic obstructive pulmonary disease, DM, liver disease, malignancy, cardiovascular diseases and gastrectomy owing to decreased immunocompetence. Data from the 2015 Global Burden of Disease studies show that 62% of all tuberculosis deaths globally occurred among adults older than 50. Comparing younger adults, increased risks of TB transmission were reported in the elderly due to longer delay of diagnosis and treatment especially in long-term care facilities for the elderly where densely populated individuals with diverse comorbidities have a greater risk.

Kochi Municipal Corporation had a “TB Free Kochi” initiative and one of the strategies in it were to do active case finding in key population. As part of the initiative, a comprehensive medical check including screening for Tuberculosis among the inmates of old age homes in Kochi corporation area was done during March 2018.

METHOD

Six old age homes were registered in Kochi Corporation under Social Justice department of Government of Kerala. The comprehensive screening program was...
Done under stewardship of Kochi Municipal Corporation and with official support of District TB Control Office and District Social Justice Department. Technical and implementation support was provided by the Amrita School of Medicine. Medical team included a pulmonologist, lady medical officer, medical interns, social workers and field workers from Amrita School of Medicine. Examination including general examination, filling a history cum clinical sheet, screening for diabetes using GRBS, hypertension screening, screening for chronic respiratory diseases, haemoglobin estimation and screening for TB for all inmates.

TB was screened for all elderly using four symptom complexes [cough for two weeks, haemoptysis, weight loss, fever or night sweats]. Anybody who had any of the symptoms were tested for TB using Xpert MTB/RIF test (Cepheid, Sunnyvale, CA) at Government Medical College, Kalamashery. Arrangements for sample transportation and testing was done by District TB Control office.

Although initial plan was to offer chest radiography as a screening tool, for logistic reasons that did not work out.

**RESULT**

ACF was conducted in five old age homes, while authorities in one of old age homes were not willing. 157 elderly inmates were screened for TB. 24 of them were bedridden and so itself did not undergo the complete examination process.

Mean age was 71.5 years. 15 of them reported that they belonged to other states. 60% were females. Among them 27 (17.2%) had a diagnosed psychiatric illness and 05 (3.2%) had epilepsy. Psychiatric illness and speaking non-regional language were barriers in eliciting complete history in approximately 10% of the inmates.

Six of them had past history of TB and another two of them were on anti TB treatment during the activity. Major TB vulnerability among the inmates were listed in Table 1.

Of the 157 inmates examined, 46 had symptoms suggestive of TB. Twenty-five of them underwent sputum examination using CB NAAT (Xpert), while for the rest, a biological sample for testing was not available. None of the samples tested were positive for Mycobacterium TB. The summary of the Active case finding activities have been summarised in Table 2. Four of the inmates had lymphadenopathy recorded in general examination.

<table>
<thead>
<tr>
<th>Table 1: Major TB Vulnerability among the inmates of old age homes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major TB Vulnerabilities Among the Inmates</strong></td>
</tr>
<tr>
<td>Undernutrition (BMI &lt;18.5)</td>
</tr>
<tr>
<td>Chronic Respiratory Diseases</td>
</tr>
<tr>
<td>Past history of TB</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
</tr>
<tr>
<td>Smoking (Past)</td>
</tr>
<tr>
<td>Alcohol (Past)</td>
</tr>
<tr>
<td>* 4 Newly detected and 6 uncontrolled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Summary of Active Case Finding for TB activities in old age homes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of old age homes covered</strong></td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

*specimen not available for the rest
DISCUSSION  
TB is rapidly becoming a public health challenge in the elderly worldwide. With longer life expectancy and declining fertility rate, the global pace of population ageing is getting faster in the new century. It was estimated the world’s population older than 60 years will be more than triple from 600 million in 2000 to 2 billion in 2050, gradually contributed by developing world. The impacts of population ageing on TB epidemiology are complicated and may vary among countries and within countries. Previous studies showed higher TB incidence and mortality in vulnerable elderly in developed world with low or intermediate TB burden, such as USA, UK, Japan, and Hong Kong. In recent research, the same challenge had increasingly been observed in developing countries with high TB burden, such as China and India.

Active case finding activity may be evaluated based on the following:
A) Additional yield during the cases
B) Whether this activity has led to increased awareness about TB
C) Extent of involvement of the other sectors and community
D) Whether the activity has identified any gaps in the programme’s reach or in access among high-risk populations
E) Cost effectiveness: the budget involved in the ACF approach compared to other forms of TB case detection needs to be known

We did not get any additional cases during the activity. Reasons could be many. First reason could lie in the algorithm we used. There have been evidences stating that fever, productive cough, night sweats, and haemoptysis are less frequent in older patients, while weight loss, weakness, anorexia, cognitive impairment, and dyspnoea are more common. Elderly are also more likely to develop atypical forms of TB such as sputum smear-negative pulmonary involvement which are often harder to diagnose and treat. We used Xpert as the initial diagnostic test during ACF. Compared with Chest X-Ray (CXR) and/or sputum smear microscopy as the initial test in TB screening, Xpert® MTB/RIF (Xpert) is a more rapid molecular diagnostic tool with a higher sensitivity in smear-positive samples and negative predictive value. Using Xpert is also justified as proportion of NTM are also high among elderly TB patients.

However, we could not obtain biological samples from 21 people who were screened positive for symptoms. X ray would have been an ideal option at least for them. Mobilising elderly for X ray outside their institution was found logistically difficult. Provisions for portable X rays or similar kind of arrangements need to be considered while planning ACF activities at old age homes.

The other reason for not obtaining a new case could be that people are getting diagnosed without much delay in old age homes in Kerala. Care takers were aware of TB symptoms and testing facilities nearby. Most of the care takers knew about treatment for TB and had experiences as DOT providers. Two of the centres also reported that District TB Control office had conducted similar activities previously there. This was just the report of a one-time activity. Regular follow up surveillance of the identified vulnerable individuals would make the picture clearer.

In the current activity ACF was combined with Sputum collection and transportation. Otherwise many of them might not have reached the testing facility. Clinical examination by doctor would have made the referral appropriate. The activity was an example of a clear mix of stakeholders- Political stewardship of Local Self Government, RNTCP offering all facilities for testing and sputum collection, doctors from a private medical college engaged in clinical examinations and social justice department co-ordinating old age homes.

Vulnerability for TB was high among the inmates of old age home as depicted in Table 1. Also, we have seen a clear deficiency in the air borne infection control practices in some of the institutions. Ideally in elderly institutions, a symptomatic patient with symptoms suggestive of TB disease should be placed in airborne infection isolation rooms or well ventilated single rooms wearing surgical masks. These factors clearly highlight the importance of placing a system for regular surveillance of TB in these kinds of institutions. By early detection and treatment, the overall goal of screening strategies need to be to prevent more TB cases and deaths by reducing the related risks, and eventually to promote life expectancy and quality. In countries like Japan and USA, screening for TB disease and even LTBI is recommended to older people being newly admitted to long-term care facilities.

The acceptability of screening could be a key factor affecting the field application. Two previous studies examined that the acceptability of screening for TB in elderly people living in institutions ranged from 72% to 95%. We also had a higher acceptability rate probably due to placing it as one of the components of a comprehensive health examination package. However, one old age home run by an NGO, allegedly to have reported many TB cases in past, did not give permission for ACF for fear of stigma to TB.

Screening for active TB infection among elderly people at admission to residential care homes has been proven to be highly effective and cost-effective in Hong-kong. It is too early for us to comment on this.

We propose establishing a system for TB screening at old age homes by training the care providers and sensitising the managements with regular support from
the primary health care providers. Active case finding should happen as a routine activity at old age homes by screening using symptom complex and X ray. Medical colleges can think of adopting old age homes for providing primary health care. Governments including Local Self Governments may pay special attention to the vulnerability reduction at old age homes.

Our experiences have shown that active case finding for TB in elderly homes in Kerala are feasible and acceptable. Our experiences, though preliminary, might be helpful in guiding practice, policy development, and future research activities. Adopting accurate and rapid diagnostic tools, regionally appropriate evidence-informed guidelines and establishing a system in place for continuous surveillance will determine the effectiveness of the intervention. Vulnerabilities for TB are high in old age homes and steps need to be taken to reduce those vulnerabilities. Facility risk assessment for air borne infection control and correcting the noncompliance with guidelines also need to be a priority along with ACF activities at old age homes.

Acknowledgements

We thank Cochin Municipal Corporation, District TB Control Office and District Social Justice Department for being stakeholders for this activity.

REFERENCES

Vitamin D Deficiency and its Association with Pain in Patients with Lumbosacral Radiculopathy

Ann Noble Zachariah*, Ravi Sankaran*, George Joseph N*, K Surendran*

ABSTRACT

OBJECTIVES: To study the prevalence of Vitamin D deficiency in patients with Lumbosacral Radiculopathy and to examine the relationship between Vitamin D deficiency and pain in patients with Lumbosacral Radiculopathy.

METHODS: This case control study was conducted at the department of Physical Medicine and Rehabilitation, Amrita Institute of Medical Sciences Kochi, Kerala, India. Forty patients with Lumbosacral Radiculopathy and 40 controls were included in the study. VAS score was attained. Vitamin D levels were measured using standard protocols. Statistical analysis was done using IBM SPSS 20.

RESULTS: Among those who were diagnosed with Lumbosacral Radiculopathy, 40% of patients (16 out of 40) were Vitamin D deficient and 37.5% (15 out of 40) were Vitamin D insufficient. The mean Vitamin D level in patients with Lumbosacral Radiculopathy was 23.15 ± 12.00 vs 31.21 ± 10.84 in controls. Among 40 cases, 10 had mild pain, 24 had moderate pain and 6 had severe pain. Out of 10 cases who were diagnosed with mild pain, 20% had low Vitamin D levels and 80% had normal Vitamin D levels. Out of 24 patients who were diagnosed with moderate pain, 95.8% had low Vitamin D levels and 4.2% had normal Vitamin D levels. All patients who had severe pain, had low Vitamin D levels. VAS score was significantly negatively correlated with Vitamin D levels (r= -0.706, p< 0.001)

CONCLUSION: The results of this study suggest that Vitamin D deficiency is prevalent in patients with Lumbosacral Radiculopathy. When compared with control groups, there is a significant reduction in Vitamin D levels in patients with Lumbosacral Radiculopathy. Vitamin D levels also correlated with severity of pain in patients with Lumbosacral Radiculopathy.

Corresponding Author: K Surendran, Professor and HOD Department of Physical Medicine and Rehabilitation AIMS, Kochi.
The demographic data was obtained for each patient at the first visit to the outpatient clinic of our department. A detailed history of the presenting complaints, past medical and surgical history, and associated comorbidities were taken. This was followed by a detailed clinical evaluation. The intensity of back pain was measured using visual analogue pain scale (VAS), where the score ranges from 0 (no pain) to 10 (worst pain) and McGill pain scale which measures the Pain Rating Index and Present Pain Intensity. Serum 25-OH Vitamin D was estimated at the time of examination using standard protocols. The results obtained were compared with the VAS score.

STATISTICS

Based on the prevalence rate of Vitamin D deficiency among Lumbosacral Radiculopathy observed in earlier publication and with 95% confidence and 20% allowable error, minimum sample size comes to 40. For the purpose of comparison, 40 controls who did not have Lumbosacral Radiculopathy were included. Statistical analysis was done using IBM SPSS 20. (SPSS Inc, Chicago, USA). For all the continuous variables, the results are given in Mean ± SD and for categorical variables as percentage. To obtain the association of categorical variables, chi square test was applied. To compare the mean difference of numerical variables between groups, independent two sample ‘t’ test was applied. To find out the relationship between two continuous variable, pearson correlation test was used. A p-value < 0.05 was considered as statistically significant.

RESULTS

Among the 40 patients that were included in the study, 50% were females and 50% were males. The patients were in the age group between 20 to 80 years with 45% of patients in age group between 20-40 years, 40% of patients in age group between 40-60 years and 15% of patient between 60-80 years. The mean Vitamin D level in age group of 20-40 years was 23.11 ± 11.22 , in age group of 40-60 years was 23.52 ±14.40 and in age group of 60-80 years was 23.15 ±12.00. The difference between the mean Vitamin D values between age groups is not statistically significant.

All the patients in this study were of the same ethnicity.

Of the included patients 70% (28 out of 40) had L5 radiculopathy, 17.5% (7 out of 40) had L4 Radiculopathy, 12.5% (5 out of 40) had S1 radiculopathy.

Among the 40 patients that included, 50% were females and 50% were males. The mean Vitamin D levels among males was 21.99± 9.29 and mean Vitamin D levels in females was 24.30 ±14.38. The difference between the mean Vitamin D values between males and females is not statistically significant.

Among those who were diagnosed with Lumbosacral Radiculopathy, 40% of patients (16 out of 40) are Vitamin D deficient, 37.5% (15 out of 40) are Vitamin D insufficient and 22.5% (9 out of 40) are Vitamin D insufficient. Graph 1

The mean Vitamin D level was 23.15 ± 12.00. For the purpose of comparison of the Vitamin D levels between patients with Lumbosacral Radiculopathy and without Lumbosacral Radiculopathy, 40 people who did not have Lumbosacral Radiculopathy were included in the study as controls. The mean Vitamin D level of cases was 23.15 ± 12.00 and the mean Vitamin D level of controls was 31.21 ± 10.84. Table 3

Among the 40 patients that were diagnosed with Lumbosacral Radiculopathy, 25% (10 out of 40) of the patients had mild pain according to VAS score, 60% (24 out of 40) had moderate pain and 15% (6 out of 40) had severe pain. According to McGill Pain Rating Index,. The mean Pain Rating Index was calculated to be 23.37 and the mean Present Pain Intensity was calculated to be 2. This value is in accordance with the studies done.
on low back pain using Mc Gill pain scale. Out of 10 patients who had mild pain, 20% had insufficient Vitamin D level and 80% had normal Vitamin D level. Out of 24 patients who had moderate pain, 45.8% of patients (11 out of 24) was Vitamin D deficient, 50% (12 out of 24) had insufficient Vitamin D level and 4.2% (1 out of 24) had normal Vitamin D level.

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Vitamin D Level</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
<td>21.99</td>
<td>9.29</td>
</tr>
<tr>
<td>female</td>
<td>20</td>
<td>24.30</td>
<td>14.38</td>
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</table>

Table 2: Comparison of Vitamin D levels between gender
Table 3: Comparison of Mean Vitamin D levels between cases and control

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Vitamin D levels</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
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<td>40</td>
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<td>12.00</td>
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<tr>
<td>Control</td>
<td>40</td>
<td>31.21</td>
<td>10.84</td>
</tr>
</tbody>
</table>

Association between VAS score and Vitamin D levels was done. Out of 10 patients who were diagnosed with mild pain, 20% had abnormal Vitamin D levels and 80% had normal Vitamin D levels. Out of 24 patients diagnosed with moderate pain, 95.8% had abnormal Vitamin D levels and 4.2% had normal Vitamin D levels. Out of 6 patients diagnosed with severe pain, 100% had abnormal Vitamin D levels and none had normal Vitamin D levels. The result was statistically significant.

While correlating the Vitamin D levels with VAS score, a negative correlation coefficient of -0.760 was found which is statistically significant. This indicates that the lower the Vitamin D levels, the higher is the VAS score; which matched the clinical findings.

Table 4: Association between Vitamin D levels and VAS score in Patients with Lumbosacral Radiculopathy

<table>
<thead>
<tr>
<th>VAS Score Category</th>
<th>Abnormal Vitamin D level</th>
<th>Normal Vitamin D level</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Mild</td>
<td>2</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Moderate</td>
<td>23</td>
<td>95.8</td>
<td>1</td>
</tr>
<tr>
<td>Severe</td>
<td>6</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>
DISCUSSION:

Lumbosacral Radiculopathy is one of the most commonly encountered neurological clinical problems. It results from nerve root impingement and/or inflammation that has progressed enough to cause neurologic symptoms in the areas that are supplied by the affected nerve root(s). The diagnosis of Lumbosacral Radiculopathy is mainly based on history and physical examination. Disc herniation and foraminal stenosis due to spondylotic degeneration are the most common etiologies for Lumbosacral Radiculopathy. Vitamin D deficiency has been postulated to have relation with Lumbosacral Radiculopathy.

All the patients in this study were of the same ethnicity. Of the included patients 70% (28 out of 40) had L5 radiculopathy, 17.5% (7 out of 40) had L4 Radiculopathy, 12.5% (5 out of 40) had S1 radiculopathy. Literature evidence shows that L5 radiculopathy is the most common which supports our study finding. This may be explained by the fact that in the lumbosacral spine, intervertebral disc affected most frequently is L4-L5 because of its mobility during flexion and extension and torsion, leading to L5 radiculopathy.

A similar study on Vitamin D level in patients with Lumbosacral Radiculopathy, where the mean Vitamin D level among males was 15.9 ± 7.2 and mean Vitamin D levels in females was 16.0 ± 6.62. The difference between the mean Vitamin D values between males and females is not statistically significant. This study also indicates that the Vitamin D deficiency is not dependent on gender.

In a similar study done by Kim et al on Vitamin D deficiency and Lumbosacral Radiculopathy, Mean serum 25-OH Vitamin D level was 15.9 ± 7.1 ng/ml where out of 350 people who were included, 74.3% (260 of 350) were vitamin D deficient, 22.9% (80 of 350) were vitamin D insufficient, and only 2.9% (10 of 350) were normal.

For the purpose of comparison of the Vitamin D levels between patients with Lumbosacral Radiculopathy and without Lumbosacral Radiculopathy, 40 people who did not have Lumbosacral Radiculopathy were included in the study as controls.

The mean Vitamin D level of cases was 23.15 ± 12.00 and the mean Vitamin D level of controls was 31.21 ± 10.84. This shows that the study group that had Lumbosacral Radiculopathy had low Vitamin D levels and the control group that did not have Lumbosacral Radiculopathy were included in the study as controls.

The mean Vitamin D level of cases was 23.15 ± 12.00 and the mean Vitamin D level of controls was 31.21 ± 10.84. This shows that the study group that had Lumbosacral Radiculopathy had low Vitamin D levels and the control group that did not have Lumbosacral Radiculopathy had normal Vitamin D levels which is statistically significant (p value of 0.002). This suggests that patients with Lumbosacral Radiculopathy have low Vitamin D levels.

Among 40 patients who were included in the study, 10 patients had mild pain, 24 patients had moderate pain and 6 patients had severe pain. Out of 10 patients who...
had mild pain, 20 % had insufficient Vitamin D level and 80 % had normal Vitamin D level. Out of 24 patients who had moderate pain, 45.8 % of patients (11 out of 24 ) was Vitamin D deficient, 50 % (12 out of 24 ) had insufficient Vitamin D level and 4.2 % (1 out of 24 ) had normal Vitamin D level.

Association between VAS score and Vitamin D levels was done. Among 40 patients who were included in the study, 10 patients had mild pain, 24 patients had moderate pain and 6 patients had severe pain. Out of 10 patients who were diagnosed with mild pain, 20 % had abnormal Vitamin D levels and 80 % had normal Vitamin D levels.

Out of 24 patients who were diagnosed with moderate pain, 95.8 % had abnormal Vitamin D levels and 4.2 % had normal Vitamin D levels. Out of 6 patients who were diagnosed with severe pain, 100 % had abnormal Vitamin D levels and none had normal Vitamin D levels. The result was statistically significant.

While correlating the Vitamin D levels with VAS score, a negative correlation coefficient of -0.760 was found which is statistically significant. This indicates that the lower the Vitamin D levels, the higher is the VAS score; which matched the clinical findings. Hence from the analysis we concluded that the more severe the pain, the lower is the Vitamin D levels.

Thus from our study conducted on 40 people, patients with Lumbosacral Radiculopathy have higher prevalence of Vitamin D deficiency and the severity of pain experienced by patients with Lumbosacral Radiculopathy has an inverse relation with the Vitamin D levels. More severe the pain, the lower is the Vitamin D level.

**STUDY LIMITATIONS**

The sample size of our study was very small. Both acute and chronic patients were included in the study. MRI evaluation was not done for all patients at the time of evaluation. General Activity and duration of sunlight exposure could not be assessed.

**CONCLUSION**

The current study suggests that Vitamin D deficiency is prevalent in patients with Lumbosacral Radiculopathy. There is also correlation with Vitamin D deficiency and severity of pain in patients with Lumbosacral Radiculopathy where higher the severity of pain, lower the Vitamin D levels. Vitamin D deficiency is not related to gender and age.

**REFERENCES**

To Assess The Level of Awareness Among General Public About Primary Trauma Care

Annrose*, Dhanashekaran B S*, Gireesh Kumar*, Sreekrishnan T P*

ABSTRACT

BACKGROUND AND METHOD: Trauma is considered as a leading cause of death worldwide due to lack of primary care. Nowadays trauma is considered as a leading cause of death worldwide due to lack of primary care. According to world health organization, every year the lives of more than 1.25 million people are dead as result of road traffic crash. The mortality among age group between 15-44 years of 48% males are more likely to be involved compare to women on that 73% of mortality occurs among young males under age of less than 25 years1. This study was aimed at assessing the level of awareness among general public about primary trauma care. A cross sectional study was conducted by assessing responses to 11 selected basic questions regarding primary trauma care among common people. This questionnaire checked the level of awareness of primary trauma care and its practical knowledge. From the responses, pre evaluation and post evaluation scores were recorded.

OBJECTIVES: To assess the level of awareness among common people about primary trauma care, To find out which age group had an improved level of awareness after the primary trauma care awareness class.

RESULTS: Out of the total 500 responders, 273 responders who had an average score about primary trauma care awareness in the pre evaluation assessment, 203 (74.4%) had good score after giving awareness class. It is showing statistically significant difference (p value <0.001). Among 195 responders who had a poor score about primary trauma care awareness in the pre evaluation assessment, 114 (58.5%) had a good score after the awareness class. It was noticed that among responders the 25-45 years age group had a better outcome, and 109(88.6%) had a good score in the post awareness assessment which was also showing statistically significant difference (p value <0.001).

CONCLUSION: In the present study, there is significant increase in the awareness among general public due to the classes about primary trauma care. Further studies with larger population may be required to establish level of primary trauma care awareness among common people.

KEYWORDS: Awareness, Trauma

INTRODUCTION

Trauma is any physical injury caused by violence or other forces. Serious trauma puts the patient at the risk of death or loss of function. Primary trauma care includes scene safety, forming general impression, and starting with primary survey – airway with cervical spine stabilization, breathing with ventilation, circulation with hemorrhage control, disability and exposure. It is very important that every person in the community must be aware about trauma and know about primary trauma care to save the life of the victim. Primary trauma care awareness should start from common people, because they are the first rescuers. Due to lack of knowledge about trauma care, it can cause negative impact to the injured people. The primary aim of this study is to assess the level of awareness among common people about primary trauma care.

METHODOLOGY

A cross sectional study was conducted by assessing responses to 11 selected basic questions regarding primary trauma care among students and common people in Thrissur & Ernakulum.

The questionnaire (11 in number) was used to assess the awareness of practical knowledge in primary trauma care. The aspects focused were done in sequential steps in primary trauma care assessment & resuscitation techniques with regards to airway with cervical spine stabilization, breathing and ventilation, circulation with hemorrhage control, disability and exposure; also the awareness about scene safety. This questionnaire was set by a panel of experts & validated by another panel.

Study Setting
School – R.M.H.S.School, Aloor Trissur
ITI College, Ernakulum
Maneed Government higher secondary school, Ernakulam Kudumbasree office, Ernakulam, GEOJIT Financial Services limited- company staff

Sample Size
Data was collected among 500 people using strict inclusion criteria. The questionnaire (11 in number) was used to assess the awareness of practical knowledge in primary trauma care.

Inclusion Criteria - Age group between 15 and 65 years.
Exclusion Criteria - Age group lesser than 15 years and greater than 65 years

STATISTICAL ANALYSIS

Statistical analysis was performed using IBM SPSS Version 20.0 software. Categorical variable are expressed using frequency and percentage. To test the statistical significant changes of before and after intervention, McNemar's test and Chi-square test was used. A p-value of <0.05 was considered as the statistically significant.

*Dept. of Emergency Medicine, AIMS, Amrita Vishwa Vidya Peetham, Kochi, India.
Questionnaire
1. What is your approach if you see an unconscious patient in motor vehicle crashes?
   A. Try to save them
   B. Inform to their relatives
   C. Immediately shift them to hospital
   D. Don't know
2. How will you approach a scene of motor vehicle crash?
   A. Look for scene safety
   B. With the help of rescue team
   C. Wait for rescue teams
   D. Don't know
3. How will you approach a patient with severe external bleeding?
   A. Compress the wound by using sterile dress or cloth piece
   B. Shift the patient to the hospital
   C. Cover the wound by using a sterile dress or cloth piece.
   D. Don't know
4. What will you do, if you suspect any fracture or breakage of bones?
   A. Push the bone back to its old position.
   B. Immobilize the fractured area.
   C. Immediately shift the patient to the hospital
   D. Don't know
5. What all precaution you will take in order to prevent further damages due to motor vehicle?
   A. Immobilization of cervical spine and whole spine
   B. Call for ambulance
   C. Shift the patient to nearby hospital
   D. Don't know
6. What will you do to protect or support the backbone and head?
   A. Wait for rescue team
   B. Log roll the patient
   C. Roll the patient to a board
   D. Don't know
7. What will you do, if the motor road traffic accident patient can't breathe?
   A. Keep the patient on recovery position.
   B. Keep patient in supine position.
   C. Give rescue breathe every 6 second.
   D. Don't know
8. What will you do, if you don't feel pulse and breathing?
   A. Start CPR
   B. Start with BLS protocol.
   C. Tap on the chest
   D. Don't know
9. How will you know the patient having heart rate or not?
   A. Radial pulse
   B. Tibial pulse
   C. Carotid pulse
   D. Don't know
10. How will you remove the helmet in road traffic accident victims?
    A. Pull the helmet by force
    B. Keep the helmet glass open
    C. Wait for the rescuer
    D. Don't know
11. According to triage category, to whom will you give primary care?
    A. Pregnant ladies
    B. Child
    C. Unconscious patient
    D. Patient with bleeding

RESULT
GENDER DISTRIBUTION
• Out of 500 people, 216 (43.2%) were females and 284 (56.8%) were males.

AGE DISTRIBUTION

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. of responder</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-25</td>
<td>274</td>
<td>54.80%</td>
</tr>
<tr>
<td>25-35</td>
<td>59</td>
<td>11.80%</td>
</tr>
<tr>
<td>35-45</td>
<td>64</td>
<td>12.80%</td>
</tr>
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<td>45-55</td>
<td>53</td>
<td>10.60%</td>
</tr>
<tr>
<td>55-65</td>
<td>50</td>
<td>10.60%</td>
</tr>
</tbody>
</table>

Table 1: Age distribution of the study object
Figure 1: Comparisons of pre and post score

Figure 2: Association of age group with post-awareness score
DISCUSSION
Trauma is a leading cause of disability and preventable death due to lack of primary care. Trauma is a leading cause of disability and preventable death due to lack of primary care. According to the national highway traffic safety administration, in 2009, 23,808 people were killed in an estimated 5,505,000 police reported motor vehicle traffic crashes; on that 2,217,000 crashes involved property damage only. On that year an average of 93 people died each day in motor vehicle crash. The present study aimed to assess the level of awareness among common people about primary trauma care. The primary trauma care awareness classes were conducted among general public. Pre and post questionnaire was circulated among them. The study population included 500 people of different age groups. Pre evaluation and post evaluation was done. The evaluation was done on the basis of a questionnaire. The questionnaire was set by panel of experts & validated by another panel. Initially pre evaluation was done and then the theory class was given to them and divided in to five groups for hands on training. Each group was taught by two emergency medical technicians. All the participants in each group had received hands on training and their doubts and mistakes were cleared then and there itself. According to their score they were classified into good, average and bad. After pre evaluation among 500 people, 273 responders were of average score, followed 195 responders of poor score and 32 responders of good score. The study showed that among 273 responders who got an average score, 203(74.4%) had a good score after giving the awareness class. Statistically, it showed a significant difference with p value <0.001. Among 195 responders of poor score in pre-evaluation, 114(58.5%) improved their score to good category in post-evaluation after awareness class. On the basis of age group, 25-45 age group of responders, had the best outcome, evident by 109(88.6%) who had good score in the post awareness score and was showing statistically significant difference (p value <0.001). The study emphasized on the cognitive approach to general perception on skills on primary trauma care and resuscitation needed. It was noted that the awareness of primary trauma care among common people was better. According to this study, to reduce trauma mortality and morbidity, all age groups should be made aware of primary trauma care, irrespective of their age group. If adequate training is given to general public by the correct knowledgeable person, there can be a significant reduction in mortality and morbidity in trauma as evident by this.

CONCLUSION
Trauma care starts with prevention. As such, it is very important to educate the public and communities to disseminate awareness and teach appropriate methods of management. Initial result shows the responders have average knowledge about primary trauma care after the awareness class. The post awareness score shows a significant change in the responders that 90.6% responders become good and it is showing statistically significant difference (p value <0.001).

Recommendation:
- Spreading the awareness about primary trauma care to common people can have the following impacts:
- **Reduction in death caused by trauma**
- **Reduction in disability**

Because of the above reason, the awareness of trauma and primary trauma care management should focus on age group of 25-45 or lower to develop a better society.

Limitation:
- Sample size includes 500 people

In conclusion, according to this study, to prevent trauma mortality and morbidity all age group should be made aware of primary trauma care, irrespective of their age group. If adequate training is given to general public by the correct knowledgeable person, there can be a significant reduction in mortality and morbidity in trauma as evident by this study.

REFERENCES
2. Nancy Caroline’s emergency care in the streets. 7th edition; American academy of orthopedics surgeons 2013 p.1494
Prevalence of Smoking Among Male Medical Students in a Tertiary Medical Care Centre in Kerala


ABSTRACT

Background: According to WHO, tobacco use is one of the leading preventable cause of premature death, disease and disability worldwide. Medical students who are future doctors have an important role to be played in tobacco cessation and prevention efforts.

Aim: To estimate the prevalence of smoking among male medical students in government medical college, Thiruvananthapuram.

Methodology: A cross sectional study was carried out among male medical students of government medical college Trivandrum using a proforma and a domain of WHO endorsed GHPSS(global health professional students survey) questionnaire. Through Stratified Sampling technique, 243 undergraduate male medical students were selected for administering the questionnaire.

RESULTS: Median age was 21 years. The overall prevalence’s of ever smokers and current smokers were 17.3% and 8.6% respectively. No one had smoked in college premises and college buildings and none of them had any snuff or bidis in their life time. Those students coming from rural areas and hostelers, had higher rates of smoking as compared to those from urban areas and day scholars.

CONCLUSION: Smoking practises among medical students of Trivandrum medical college is fairly high. Smoking cessation initiatives should be implemented effectively. Medical educators should consider revising medical curricula to improve training about tobacco cessation in medical colleges.

INTRODUCTION

World Health Organisation has alarmed the increasing prevalence of tobacco use among adolescents all over the world. An estimated 6 million deaths occurring annually can be attributed to tobacco use. This may even increase to 8 million by year 2030, if the current tobacco epidemic continues and more than 70% of these deaths are expected to occur in developing nations. More than five million of 6 million deaths occurring annually are the result of direct tobacco use while more than 60000 are as a result of second hand smoke1.

Although many of the adverse health effects of tobacco occur later in life, smoking has health implications for young people and is associated with other high-risk behaviours among young people including abuse of other drugs, fighting and high-risk sexual behaviour. Each day, nearly 4800 adolescents smoke their first cigarette; of these, nearly 2000 will become regular smokers. While many adolescents want to quit smoking, only a small number of them succeed.

Doctors have a major role to play in addressing this threat by providing primary care, creating awareness among the people about the ill effects of tobacco, aiding in tobacco cessation and in providing pharmacologic assistance. As a result, tobacco control represents a key area in which doctors can make a positive impact on their patients’ lives.

Medical students who are future doctors have an important role to be played in tobacco cessation and prevention efforts. On the contrary, a vast body of evidence shows the prevalence of tobacco is fairly high among medical students.

Expert values have suggested that undergraduate medical student should be equipped with knowledge and skills to promote smoking cessation among their future patients.

Since tobacco use practices and beliefs about tobacco are formed early in life, it becomes interesting to look at the development of tobacco use among medical students especially males despite their knowledge of involved risks.

Thus this study estimates the prevalence of tobacco use using WHO endorsed Global Health Professional Students Survey (GHPSS) questionnaire and a pro forma among male medical students in Government Medical College, Thiruvananthapuram.

METHODOLOGY

A cross sectional study using the Global Health Professional Student Survey (GHPSS) questionnaire was conducted on 243 undergraduate male medical students s, from first year to final year in Government Medical College, Thiruvananthapuram(GMCT). This validated tool allows for comparison with different cohorts of students with in India as well as in other countries. Since we wanted to assess the pattern among all the male students, the study was extended to include all students from first to final year of under graduation.

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"Dept. of Public Health Dentistry, Govt Medical College, Thiruvananthapuram.***Dept.of Community Medicine. AIMS, Amrita Vishwa Vidyapeetham-Kochi, India.
There are 5 batches of MBBS students studying in GMCT. Sampling frame of male undergraduate MBBS students was constructed and by random number function of 2007 Microsoft excel, a random sample of approximately 48 students from each batch were selected to meet a total of 243 students. Stratified Random Sampling Technique was employed considering each batch as a stratum.

**Data Collection Tool**

After a detailed review of literature and informal discussions with students we developed a structured questionnaire in English. Questions on smoking were adopted from WHO endorsed GHPSS (Global Health Professional Students Survey) questionnaire. The GHPSS core questionnaire consisted of a total of forty two items addressing five domains Only one domain addressing the ‘tobacco use prevalence among health professional students’ part in GHPSS core questionnaire is used in our questionnaire. Two questions on behavioural patterns were added.

The questionnaire was self-administered to all the participants during small group sessions with the investigators. The study was conducted for a duration of 10 days from October 14-25th 2014. The objectives of the study was explained to the participants and an informed consent was obtained.

Ethical clearance was obtained from the Institutional Ethics Review Board. The identity of the participants was not documented anywhere in the questionnaire to minimize social desirability bias. The participants collected the questionnaire from the researcher and after filling it up, anonymously placed it within a file. The process of administration of the questionnaire was clearly explained to the participants to minimize response bias.

**Data Analysis**

Data was entered in Microsoft excel 2007. Any inconsistencies found in the data was verified with the completed questionnaires and data was cleaned. It was analysed using SPSS (statistical package for social sciences) 18 trial version and WinPepi.

Sociodemographic details were analysed. We calculated rates of ‘ever smoker’ and ‘current smoker’ among male medical students according to our defined criteria. For bivariable analysis, we used chi square to test the statistical significance for observed differences between categorical variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ever smoker-N (%)</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Yes</td>
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<tr>
<td><strong>Geographic Area</strong></td>
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<td>19</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td><strong>Stay</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home*</td>
<td>1</td>
<td>99</td>
<td>0.025</td>
</tr>
<tr>
<td>Hostel</td>
<td>41</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>29</td>
<td>120</td>
<td>1.830</td>
</tr>
<tr>
<td>Christian</td>
<td>6</td>
<td>28</td>
<td>1.622</td>
</tr>
<tr>
<td>Muslim*</td>
<td>7</td>
<td>53</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Year of study</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III year and above</td>
<td>35</td>
<td>112</td>
<td>3.9</td>
</tr>
<tr>
<td>I and II year</td>
<td>7</td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>

OR-Odds Ratio; CI-Confidence Interval;p<0.05# -statistically significant;*-reference category

Table 1: Association of various sociodemographic variables and Ever smoking
RESULTS
Definitions of Ever Smoker and Current Smoker
An ‘ever smoker’ is defined as one who had smoked during his life time even if he had tried a few puffs once or twice. A ‘current smoker’ is defined as one who had smoked during 30 days prior to the survey including the ones who smoked every day.

243 male medical students participated in our study. Of the 243 male medical students, 42 were ever smokers and 21 were current smokers. The prevalence of ever smoking was 17.3% and current smoking was 8.6%.

Descriptives
Mean age of our study participants was 20.84± 1.453 and median age was 21.6. 1.3% of our male medical students belong to middle socio economic status. Majority of students (58.8%) were staying at hostel (college men’s hostel or other private hostels).

Majority of students (82.7%) never used any cigarettes during their lifetime. Four (1.6%) of our study participants initiated the habit of smoking between 11-15 years, 14 of them during 16-17 years and 8 of them started the habit at 18-19 years of age. Only 16 (6.6%) of the study participants initiated smoking between 20-25 years of age. Mean age of initiation of smoking habit was found to be 18.8 years.

Among the ever smokers no one ever used chewing tobacco (gutkha, pan), snuff, bidis, hookah, cigars or pipes or smoked in college premises. Only 7.4% (18) of ever smokers want to quit smoking. 86.04% of the current smokers want to quit smoking.

All our study participants had attended lecture classes about side effects of smoking and about smoking cessation.

Bivariable Analysis
The association of various socio demographic characteristics with ever smoking (Table 1) and current smoking (Table 2) is shown below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Current smoker- N (%)</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Geographic Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural*</td>
<td>11(52.4)</td>
<td>78(35.1)</td>
<td>2.03</td>
</tr>
<tr>
<td>Urban</td>
<td>10(6.5)</td>
<td>144(93.5)</td>
<td></td>
</tr>
<tr>
<td>Stay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home*</td>
<td>1(4.8)</td>
<td>99(44.6)</td>
<td>0.062</td>
</tr>
<tr>
<td>Hostel</td>
<td>20(95.2)</td>
<td>123(55.4)</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>14(66.7)</td>
<td>135(60.8)</td>
<td>1.141</td>
</tr>
<tr>
<td>Christian</td>
<td>2(9.5)</td>
<td>32(14.4)</td>
<td>1.000</td>
</tr>
<tr>
<td>Muslim*</td>
<td>5(23.8)</td>
<td>55(24.8)</td>
<td></td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III year and above</td>
<td>20(95.2)</td>
<td>127(57.2)</td>
<td>14.96</td>
</tr>
<tr>
<td>I and II year</td>
<td>1(4.8)</td>
<td>95(42.8)</td>
<td></td>
</tr>
</tbody>
</table>

OR-Odds Ratio; CI-Confidence Interval;p<0.05#-statistically significant;*-reference category

Table 2: Association of various sociodemographic variables with Current Smoking

DISCUSSION
The prevalence of ever smoking and current smoking in our study is 17.3% and 8.6%. This prevalence is comparatively less as compared to other studies. A study done among medical students at Saudi Arabia showed ever smoking prevalence of 48.2% and current smoking prevalence of 28.9%.

A survey done among first and second year medical students found the prevalence of current smoking to be 6% which is in accordance with our findings.

Most of the study participants initiated the habit of smoking before 20 years. They might have started the habit before entry to medical college or during the initial days of college life. Previous research has suggested...
that early smoking initiation predicts longer duration of smoking, heavier daily consumption, and increased chances of nicotine dependence. Evidence suggests that the likelihood of cessation was significantly higher in smokers who initiated smoking after age 13. Hence measures should be taken to discourage early smoking that can reduce the smoking-related mortality and morbidity by increasing the potential for quitting. The prevalence of ever smoker among male medical students in Thiruvananthapuram medical college was 17.3%. The prevalence of current smokers among male medical students in Thiruvananthapuram medical college was 8.6%. Anti-smoking campaign should be conducted among students to provide health education, counselling and tobacco cessation measures among medical students. Classes on tobacco, its side effects should be taken by experts. The effectiveness of all these programmes should be monitored. This study seeks the attention of stakeholders to implement strict measures against the use of tobacco in professional institutions and to make tobacco cessation counselling an integral part of existing medical curriculum.

We cannot afford the loss of medical manpower, who are capable of saving many lives in future.

REFERENCES

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Maxillary Arch Form Variation and their association with Preformed Arch wires

Shilpa Dineshan*, Rahul D.P*, Maria John Kuriakose*, Ajith V.V*, Sapna Varma N.K*

ABSTRACT

Context: The procurement of a functional and aesthetic arch form has long been a cardinal objective of orthodontists. This study sheds light on clinical dilemma of possible implications of use of preformed arch wires in different archforms for Orthodontic treatment.

Aim: To understand the Maxillary Arch form variations and their association with Preformed arch wires.

Settings and design: Records maintained for orthodontic treatment were used for this in-vitro record based study.

Materials and Method: Hundred plaster casts of untreated patients from Kochi, Kerala above 12 years were selected based on the inclusion/ exclusion criteria. This was conducted as a pilot study to examine the feasibility of approach. The arch width was measured on the cast using a digital calliper accurate to 0.001 mm. Further two preformed arch wires were approximated to the study models and measurements made at Inter -canine, Inter- Premolar and Inter- Molar areas.

Statistical analysis: Statistical analysis was performed using SPSS software. Paired t-tests were used to determine whether the differences in measurements between the intercanine, interpmolar and intermolar widths with its corresponding G&H and Damon were statistically significant. A p value < 0.01 was considered as a significant outcome.

Results: The intercanine, interpmolar and intermolar arch width showed statistically significant difference when compared between the study models and Damon and G&H archwire.

Conclusions: Both arch wires tested were wider in dimension compared to the mean arch form of the study models. The wider arch wires may lead to expansion in arch dimensions. Hence the clinician should judiciously select preformed arch wires based on their clinical requirements.

Keywords: Preformed arch wires, maxillary arch form.

INTRODUCTION

The archwire materials have evolved from initial gold wires to stainless steel, nickel titanium (NiTi), Beta Titanium, Copper NiTi and to the more recent Optiflex wires.1 The shape of arch wires have also evolved from round, square, and rectangular to recent bevelled surfaces.2,3 Andrews introduced the straight wire appliance in 1970 with the main goal of reducing chair time for the fabrication of arch wires. The shape of the arch wire determines the future arch form, and the tooth movement within the created outline.4 The range of selection in the current commercially available preformed orthodontic arch wires does not appropriately cover diverse dental arch forms.4 Disparate arch form and arch size were reported among various racial groups.5 Stability of orthodontic treatment depends on maintaining the patient’s pre-treatment arch form and arch size during and at the end of treatment.6,5 Long term stability and aesthetics are directly related to arch form.7 The different classifications of arch form that have been suggested are ovoid, tapered, square.3,7,8 This classification is usually done based on the clinical experience of the orthodontist or using preformed arch wires from certain companies.8 Dental arches vary in different races and populations.15 Therefore, arch wires should be selected according to the related population’s arch size and arch shape9. Braun et al,9 compared thirty-three preformed nickel-titanium wires with normal dental arches and reported the Intercanine and Intermolar widths of upper and lower preformed arch wires were larger than the average dental arch widths in almost their entire sample.

Tulin Taner et al10 identified an increase in maxillary and mandibular arch widths of Turkish patients, increased during orthodontic treatment when compared to their pre-treatment dimensions. The purpose of this study is to understand the Maxillary Arch form variations and their association with arch wires in a tertiary care center. This study would shed light on clinical dilemma of space gaining by arch wire expansion with Damon and G&H arch wires. Damon arch wires which is widely publicised for their ability to expand a constricted arches and G&H arch wires which are widely available in tertiary care centers.

MATERIALS AND METHODS

A total of 100 Plaster cast of untreated patients above 12 years old were employed in the study. The samples included natives of Kochi. Patient records were included if they satisfied the following inclusion criteria:

1) Full natural permanent dentition, excluding third molars.
2) Angle Class I molar relationship with arch form symmetry and minimal arch-length discrepancy.
3) Ideal overjet and overbite.
4) Mild to moderate crowding. 

**The exclusion criteria were:**
1) Study Models with an Angles classification of unilateral or bilateral full cusp Class II or Class III.
2) Study models with unilateral or bilateral crossbites.
3) Study models of Patients having any systemic diseases, craniofacial syndrome, and those determined to need corrective jaw surgery.
4) Study models of Patients who were debonded ‘early’ for any reason (including poor compliance and poor hygiene).
5) Study models with incomplete or poor records.
6) Study models with prosthetic crowns and signs of occlusal attrition were excluded.

Upper and lower Alginate based impressions were recorded from each patient. The dental arch width was measured on the dental cast/Study models using a digital calliper accurate to 0.001 mm (Mitutoyo 500-196-30 - Advanced Onsite Sensor - Absolute Scale Digital Calliper).

The following maxillary dimensions were measured with and without the preformed arch wires.
- Intercanine width (widest labial aspect of Permanent Canine).
- Interpremolar width (widest labial aspect of First Premolar).
- Intermolar widths (widest buccal aspect of First Permanent Molar).

Two kinds of preformed arch wires were used in the study:

1) Damon arch wire (0.014’ NiTi light round wire) (Ormco)
2) **G&H Europa form 1 arch wire. (0.014” round NiTi)** (G&H Orthodontics; Franklin, IN)

On each model, the long axis of each tooth was identified and used as a reference for the centre of the clinical crown.

All the measurements were performed by the same investigator. The width distribution of preformed G&H and Damon arch wires were recorded by approximating arch wires at the canine, premolar and first-molar levels on each study model. The results were compared with appropriate statistical tests. The study was an in-vitro record-based study.

**STATISTICAL ANALYSIS**

Statistical analysis was performed using SPSS software version 22.0 (IBM, Armonk, NY). The results obtained were expressed as mean and standard deviation. Paired t-tests were used to determine whether the differences in G&H and Damon arch wire measurements made at the intercanine, inter premolar and inter molar levels. A p value < 0.01 was considered as a significant outcome.

**RESULTS**

The measurements made at inter canine levels of maxillary study models (Table 1) showed statistically significant difference (p<0.001) between the two type of arch wires. Both arch wires demonstrated significant increase in dimensions at inter canine level. Damon arch wire also showed significant increase in dimension when compared to G&H wire.

The measurements made at inter premolar levels of maxillary study models (Table 2) showed statistically significant (p<0.001) between the two types of arch wires. Damon Arch form were significantly wider than inter premolar width of study models. The G&H arch form

<table>
<thead>
<tr>
<th>INTER-CANINE WIDTHS</th>
<th>Mean ± Std.Deviation (mm)</th>
<th>p value (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTER CANINE</td>
<td>39.15±2.69</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DAMON</td>
<td>39.65±2.59</td>
<td>0.006</td>
</tr>
<tr>
<td>INTER CANINE</td>
<td>39.15±2.69</td>
<td></td>
</tr>
<tr>
<td>G&amp;H</td>
<td>39.28±2.61</td>
<td></td>
</tr>
<tr>
<td>DAMON</td>
<td>39.65±2.59</td>
<td></td>
</tr>
<tr>
<td>G&amp;H</td>
<td>39.28±2.61</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Comparison of Maxillary Inter-Canine width with Arch wire dimensions.
were also significantly wider than InterPremolar width of study models. The G&H Widths were also quantitatively closer to interpremolar width of study model when compared to Damon Arch Forms.

<table>
<thead>
<tr>
<th>INTERPREMOLAR WIDTHS</th>
<th>Mean ± Std.Deviation (mm)</th>
<th>p value (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTER PREMOLAR</td>
<td>45.30±2.66</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DAMON</td>
<td>45.87±2.68</td>
<td></td>
</tr>
<tr>
<td>INTER PREMOLAR</td>
<td>45.30±2.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>G&amp;H</td>
<td>45.50±2.66</td>
<td></td>
</tr>
<tr>
<td>DAMON</td>
<td>45.87±2.68</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>G&amp;H</td>
<td>45.50±2.66</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Comparison of Maxillary Inter-Premolar width with Arch wire dimensions

The measurements at the inter molar levels of maxillary study models (Table 2) showed statistically significant (p<0.001) between the two types of arch wires the inter-molar width (Table 3) of the study model (55.81 ± 3.13) were significantly different from the Damon group (56.44 ±3.17) & G&H arch wire (56.14 ± 3.18) and the values were much closer to G&H arch wire than Damon arch wire.

<table>
<thead>
<tr>
<th>INTERMOLAR WIDTHS</th>
<th>Mean ± Std.Deviation (mm)</th>
<th>p value (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTER MOLAR</td>
<td>55.81±3.13</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DAMON</td>
<td>56.44±3.17</td>
<td></td>
</tr>
<tr>
<td>INTER MOLAR</td>
<td>55.81±3.13</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>G&amp;H</td>
<td>56.14±3.18</td>
<td></td>
</tr>
<tr>
<td>DAMON</td>
<td>56.44±3.17</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>G&amp;H</td>
<td>56.14±3.18</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Comparison of Maxillary Molar width with Arch wire dimensions

**DISCUSSION**

In many studies relating to arch form, various authors have attempted about defining an arch form that is ideal, but through the various studies it has been noticed that there are numerous individual changes seen\(^7,12\). The results of our study also conforms the need of customised arch unless indicated by the malocclusion requirements. Damon system has gained increasing popularity since their introduction by Dwight Damon in 1996.\(^13\) A comparison study of Damon system and convention edgewise system reported the Damon system produced an overall in transverse dimension as well as mandibular lower anterior proclination.\(^14\) Vajaria et al\(^14\) and Pandis et al\(^15\) have also confirmed that there is significant increase in arch dimensional in the intermolar region for Damon System when compared with conventional systems. Further, Mikulencak et al,\(^16\) observed that maxillary arch expansion using the Damon system produced a significant arch width change in the molar and pre-molar areas. The increase in transverse dimension in the Damon group could be attributed to the wide Cu-NiTi arch wires that were used during the first part of treatment.\(^14\) The expansion achieved using Damon System would be beneficial in alleviating crowding in indicated cases. However, the arch expansion at the
posteriors received from any arch form in a continuous arch form may also result in unintentional labial movement of anterior teeth. The only relevant study in the literature comparing conventional and self-ligating brackets was by Blake et al., who found no difference in the amount of root resorption. Interestingly, it is the use of light and constant forces that has been linked with higher EARR prevalence. Regarding the amount of root resorption, an average of 0.3 mm in self-ligating group and an average of 0.35 mm in conventional bracket group were found. 

Our study has compared the association of a conventional and Damon system in the maxillary arch of hundred patients with a Class I malocclusion. The results of the present study on plaster cast models have showed that there is significant difference in arch widths among the Damon and Conventional arch form especially in the molar region with p value < 0.001. The results of the study indicate the potential arch form variation upon using the two types of arch wires.

Our study describes in vitro association of arch wire to arch form discrepancy. The clinical effect of two wires may vary intraorally as one wire is thermal sensitive and while other wire is conventional Nickel Titanium. The expansions of arch wires may also be influenced by patient’s masticatory pattern as well as bone quality. The study only discusses maxillary expansion; further studies are planned on mandibular arch association and the clinical changes of arch morphology using the two arch wires.

CONCLUSIONS

Based on our study, we would like to suggest both arch wires tested were wider in dimension compared to the mean arch form of the study models. The wider arch wires may lead to expansion in arch dimensions. Hence clinician should judiciously select preformed arch wires based on their clinical requirements.

REFERENCES

Topical anesthesia with supplemental intracameral lignocaine as an alternative to peribulbar block for phacoemulsification: A comparison of effectiveness, safety and satisfaction of surgeon and patients

Saritha Valsala Krishnankutty*, Vijayamma Narayani*

ABSTRACT

Background: The advantage of topical anesthesia is lack of injection-related complications. But there are reports of superiority of peribulbar block over topical anesthesia in terms of patient comfort.

Aims: To assess patient comfort, adequacy of intraoperative analgesia, surgeons’ comfort and development of complications following peribulbar block versus topical anesthesia with supplemental intracameral lignocaine during phacoemulsification.

Material and Methods: This prospective observational study was conducted in a tertiary care teaching institution. Twenty patients undergoing phacoemulsification of both eyes two weeks apart were allocated into either Group T or Group P. One eye of each patient was operated under peribulbar block and the other eye under topical anesthesia with supplemental intracameral lignocaine. Patient comfort was assessed using Numeric Pain Rating Scale during administration of anesthesia, phacoemulsification, soon after surgery and 4 hours later. After procedure, the surgeon’s comfort was also documented. Paired t-test was used for statistical analysis.

Results: Group P patients had significantly higher pain score compared to Group T (7 vs 0) during block. Pain scores intraoperatively and postoperatively did not show any significant difference between groups. Surgeon’s comfort was also comparable. All patients in Group P had discomfort and felt pressure on eye during block, none in Group T had such complaints. Though the incidence was almost double in Group T intraoperatively and postoperatively, the difference was insignificant.

Conclusion: Topical anesthesia with supplemental intracameral lignocaine is a safe and effective alternative to peribulbar block for phacoemulsification. It is associated with significantly higher patient comfort with comparable surgeon’s comfort.

Key words: topical, lignocaine, analgesia, comfort, phacoemulsification

INTRODUCTION

Cataract surgeries were initially performed under retrobulbar block and gradually there was a change in trend towards peribulbar block and later to topical anesthesia. The advantage of topical anesthesia over peribulbar or retrobulbar block is lack of injection-related complications. However some studies have reported superiority of peribulbar block over topical anesthesia in terms of patient comfort.1,2 We hypothesized that addition of intracameral lignocaine to topical anesthesia would overcome the concerns over inadequate intraoperative analgesia and thereby provide better patient comfort.

AIM OF THE STUDY

The primary objective of the present study was to assess patient comfort following peribulbar block versus topical anesthesia with supplemental intracameral lignocaine during phacoemulsification. Secondary objectives included assessment of adequacy of intraoperative analgesia, surgeons’ comfort and development of complications following both these techniques.

1 Dept. of Ophthalmology, Government Medical College, Kottayam

MATERIALS AND METHODS

This prospective randomized single blinded study was conducted after obtaining Institutional Ethical Committee clearance and patients’ consent. Twenty patients aged 50-80 years with bilateral uncomplicated senile cataract, with no history of previous ocular co-morbidities, injury, or surgery were recruited into the study. Those who had to undergo phacoemulsification of both the eyes two weeks apart were only included. Exclusion criteria included coagulopathy, use of antiplatelet drugs, presence of Parkinsonism, cognitive disorders, Alzheimer’s disease, claustrophobia, chronic spontaneous cough, hearing difficulty and allergy to local anesthetics.

Patients were randomly allocated into either Group T or Group P before phacoemulsification of the first eye based on computer generated random sequence of numbers and allocation concealment was ensured using sequentially numbered opaque closed envelopes. The other eye was operated one to two weeks later under the alternative block so that one eye of each patient was operated under peribulbar block and the other eye under topical anesthesia with supplemental intracamer-
al lignocaine. After allocation to one of the groups an intravenous line was started in the premedication room. For the Group T, topical anesthesia was provided soon after dilating the pupil but before the start of the surgery by instilling one drop of proparacaine hydrochloride 0.5% four times at an interval of 2 min. Patients were asked to keep their eyes closed after instillation of topical anesthetic. In the operation theatre standard monitors like electrocardiogram, pulseoxymeter and noninvasive blood pressure monitors were attached. From beginning of surgery the patients were asked to keep their eyes open and were requested to fix towards microscope light during the procedure.

For Group P, peribulbar block was given with 5-7 ml of 2% lignocaine with 1:10000 adrenaline using a 24G needle. The needle was inserted at the junction of middle and outer third of the lower orbital margin and directed toward the floor of the orbit. The eyelids were closed, and uniform pressure was applied on the site for 2-3 min. All patients underwent 2.8mm clear corneal phacoemulsification (Infiniti, Alcon) with foldable IOL implantation. Continuous verbal communication was maintained between the surgeon and patient throughout the surgery. Before instillation of local anesthetic, incision, insertion of phaco probe and implantation of foldable intraocular lens, patients were informed about the same in both groups.

Patient comfort was assessed using Numeric Pain Rating Scale (NPRS) by an assessor blinded to the technique of anesthesia. Patients were briefed about the use of this pain scale preoperatively. The 11-point numeric scale ranges from 0 (“no pain”) to 10 representing “pain as bad as you can imagine” or “worst pain imaginable”. Four hours postoperatively, patients were quizzed about pain they experienced during administration of anesthesia, phacoemulsification with intraocular lens implantation, soon after surgery and 4 hours later, which was scored (Table 1). Discomfort and feeling of pressure in the eye during administration of injection, during surgery and 4 hours post operatively were also assessed (No = 0, Yes = 1).

After procedure, the surgeon’s comfort was documented based on intraoperative positive pressure, chemosis, subconjunctival hemorrhage, and the overall comfort was scored (Table 1). Any change in surgical technique, need of supplemental anesthesia and intraoperative complications, if any, were also documented. Paired t-test was used to compare the various parameters at different time points. Statistical analyses were done using SPSS version 20.0 for Windows (IBM Corporation, ARMONK, NY, USA).

<table>
<thead>
<tr>
<th>Patient’s comfort</th>
<th>Surgeon’s comfort</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRPS - 0</td>
<td>Not difficult (Patient comfortable)</td>
</tr>
<tr>
<td>1 – 2</td>
<td>Slightly difficult (Patient uneasy)</td>
</tr>
<tr>
<td>3 – 4</td>
<td>Moderately difficult (Patient repeatedly squeeze eyes)</td>
</tr>
<tr>
<td>5 – 8</td>
<td>Extremely difficult requiring additional analgesia (Patient having unbearable pain)</td>
</tr>
<tr>
<td>9 – 10</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Assessment of patient’s and surgeon’s comfort
RESULTS

Mean age of patients was 57.4±9.5 years. Out of the 20 patients recruited half were females. Comparison of NRS during administration of block showed that Group P patients had significantly higher pain score compared to Group T (7 vs 0, p <0.001). Pain scores intraoperatively, immediately after surgery and 4h postoperatively did not show any significant difference between the groups (p <0.05, Table 2). Surgeon’s comfort was also comparable in both groups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group P Median (Min-Max)</th>
<th>Group T Median (Min-Max)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRS at block</td>
<td>7.0 (5-10)</td>
<td>0 (0-1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>NRS intraop</td>
<td>0 (0-2)</td>
<td>0 (0-1)</td>
<td>0.603</td>
</tr>
<tr>
<td>NRS immediate postop</td>
<td>0 (0-0)</td>
<td>0 (0-0)</td>
<td>1.000</td>
</tr>
<tr>
<td>NRS 4h postop</td>
<td>0 (0-2)</td>
<td>0 (0-1)</td>
<td>0.938</td>
</tr>
<tr>
<td>Surgeon’s comfort grade</td>
<td>0 (0-3)</td>
<td>0 (0-1)</td>
<td>0.500</td>
</tr>
</tbody>
</table>

Table 2: Patient pain as assessed with numerical rating scale and surgeon’s comfort

While all patients in Group P had discomfort and felt pressure on eye during block, none in Group T had such complaints and the difference was statistically significant (p <0.001). Though the incidence of such complaints were almost double in Group T intraoperatively (30% vs 15%) and 4h postoperatively (20% vs 10%), there was no statistical significance (Table 3, Figure 1).

<table>
<thead>
<tr>
<th>Time</th>
<th>Group P n (%)</th>
<th>Group T n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>During block</td>
<td>No</td>
<td>20 (100.0)</td>
<td>20 (100.0)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Group P n (%)</th>
<th>Group T n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intraop</td>
<td>No</td>
<td>17 (85.0)</td>
<td>14 (70.0)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>3 (15.0)</td>
<td>6 (30.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Group P n (%)</th>
<th>Group T n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>4h post op</td>
<td>No</td>
<td>18 (90.0)</td>
<td>16 (80.0)</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>2 (10.0)</td>
<td>4 (20.0)</td>
</tr>
</tbody>
</table>

Table 3: Patient’s discomfort and pressure on eye

Intraoperative positive pressure as assessed by surgeon remained normal in all patients in Group T, whereas it was high in 10% of patients in Group P. Group P had significantly higher incidence of subconjunctival hemorrhage (70% vs 20%) and chemosis (70% vs 0%, Table 4, Figure 2).
Topical anesthesia with supplemental intracameral lignocaine as an alternative to peribulbar block for phacoemulsification: A comparison of effectiveness, safety and satisfaction of surgeon and patients

![Figure 1: Comparison of patient comfort](image1)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group P n (%)</th>
<th>Group T n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2 (10.0)</td>
<td>-</td>
<td>0.487</td>
</tr>
<tr>
<td>Normal</td>
<td>18 (90.0)</td>
<td>20 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Subconjunctival hemorrhage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>6 (30.0)</td>
<td>16 (80.0)</td>
<td>0.004</td>
</tr>
<tr>
<td>Yes</td>
<td>14 (70.0)</td>
<td>4 (20.0)</td>
<td></td>
</tr>
<tr>
<td>Chemosis</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>6 (30.0)</td>
<td>20 (100.0)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14 (70.0)</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 2: Comparison of surgeon's comfort](image2)
DISCUSSION

As incisional size of cataract surgery has reduced over the last few decades, anesthesia techniques have also changed drastically from general anesthesia through retrobulbar and peribulbar blocks to topical anesthesia. Decreasing popularity of retrobulbar block was due to greater risk of complications like retrobulbar hemorrhage, central retinal artery occlusion, chemosis, penetration or perforation of the globe, central spread of local anesthetic, oculocardiac reflex, optic nerve atrophy and postoperative strabismus. Theoretically, peribulbar anesthesia eliminates the risk of complications such as optic nerve injury and central nervous system spread of anesthesia from intradural injection. But it is slower in onset and slightly less effective than the retrobulbar for providing akinesia and anesthesia. Evolving surgical techniques have reduced the need for akinesia. Pain during peribulbar anesthetic has been documented to be higher compared to topical anesthetic and was the main reason for negative feedback from patients in previous studies. Sub-Tenon’s block has become the most common technique of orbital regional anesthesia in many centers now. But many of the complications are the same as those of peribulbar and retrobulbar blocks. Topical anesthesia should be reserved for patients who are cooperative and can tolerate the microscope light with a dilated pupil. It is usually administered as topical procaine (1, 2 or 10%), proparacaine (0.5%), oxybuprocaine (0.4%), tetracaine (0.5% or 1%), bupivacaine (0.25 or 0.5%), etidocaine (1%), lignocaine (2 or 4%), prilocaine (4%), and ropicacaine (0.2 or 1%). Topical anesthesia is used to block the afferent nerves of the corneal and the conjunctiva. However, it does not eliminate pain sensitivity of the iris, the zonule, and the ciliary body and hence may be supplemented with the intracameral preservative-free lignocaine. In patients with open posterior capsule or previous vitrectomy, there is a risk of transient amaurosis secondary to a direct retinal effect following the use of intracameral anesthetic. Intracameral anaesthesia provides sensory blockage of the iris and ciliary body and thereby relieves discomfort experienced during intraocular lens placement. However the retained visual sensations like seeing light, colours, movements and instruments during surgery are expected to occur more frequently under topical anaesthesia because optic nerve function is not affected. In some patients the experience can be unpleasant or even frightening. This complication can be alleviated with pre-operative counseling and intravenous premedication with midazolam. Intravenous dexmedetomidine 1µ.kg-1 when used during cataract surgery under topical anesthesia was associated with better patient and surgeon satisfaction.

Ahmad N et al reported that patient satisfaction was more for peribulbar block when same patients underwent bilateral phacoemulsification under peribulbar block for one eye and topical anesthesia for the other eye. The difference from our study was that there was no addition of intracameral lignocaine in their study. Almost similar observation was made by Dole et al also. These findings suggest that supplementing topical anesthesia with intracameral local anesthetic will improve patient comfort intraoperatively.

The strong points of our study were that same patients constituted both the groups and each of them compared comfort following both techniques thereby eliminating subjective variability. All surgeries were performed by the same surgeon thereby eliminating subjective variability regarding assessment of surgeon’s comfort as well.

Our study was not without flaws. As it was an open label study, only the interviewer documenting patient comfort was blinded. Since the patient and the surgeon were not blinded regarding technique of anesthesia, there was a possibility of some bias while the comfort scores were being assessed.

CONCLUSION

Topical anesthesia with supplemental intracameral lignocaine is a safe and effective alternative to peribulbar block for phacoemulsification with foldable IOL implantation. It is associated with significantly higher patient comfort and lower complications with comparable surgeon’s comfort.

REFERENCES


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Reference to a chapter in a book:


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