



भाभा परमाणु अनुसंधान केंद्र
BHABHA ATOMIC RESEARCH CENTRE

Pulse

HOUSE MAGAZINE OF BARC HOSPITAL

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In Conversation



Heart to Heart with Dr. Anvay Mulay

Dr Anvay Mulay! The heart transplant surgeon, who hit the headlines after his first successful transplant in August 2015, followed by 11 more transplants in a short span of 6 months!

The Editorial Team (ET) in a candid conversation with him (AM).

ET: Congratulations on your phenomenal achievement! Heart transplants were not heard of in Mumbai after the first one in 1968. What was your inspiration to undertake this challenging surgery?

AM: I had patients in my practice who were dying of end stage heart failure, for whom we had nothing to offer. They were my motivation to start thinking about heart transplants. I used to feel sad and helpless seeing patients in ICU dying of cardiomyopathies. Basically there are only four drugs in modern medicine that can be used to treat and prolong life in cardiac failure. Despite treatment, these patients need recurrent hospitalisations, ICU care and eventually either pacemaker or an AICD (mechanical assisted device) to prolong life. I discussed this with my team and we started the heart failure clinic at Fortis hospital, Mulund. This was the beginning.

One patient I will always remember, was a young lady with postpartum dilated cardiomyopathy. She had two young children and had come to me after 8 years of diagnosis. She had deteriorated suddenly and had to be admitted to the ICU. The family was reluctant to believe that she needed a heart transplant as none of the previous treating doctors had ever suggested this. Then I convinced them that she needed atleast a mechanical assisted device to survive. The family was not able to afford it and I decided to sponsor it as a gift on my birthday. All arrangements were made for the operation on a Monday morning. The device was to reach Mumbai from Delhi. Unfortunately on Sunday evening her condition deteriorated and I was in the ICU the whole night giving shocks to her heart to revive her. I must have given 100-150 shocks but she couldn't make it. This incident, on my birthday, shook me and I decided to take whatever steps were necessary to get registration of our hospital for heart transplantation. We got registration for heart transplant in January 2015.

ET: Can any hospital conduct heart transplant in their operation Theatre (OT) or is some special infrastructure needed?

AM: The most important step in starting a transplant centre is to have a good, well equipped Heart Failure Clinic. More important than the technical specificities of a Transplant Operation theatre, is a team of dedicated doctors. I have been fortunate to have such a committed team of Cardiac Surgeons, Anaesthesiologists and Intensivists who are available round the clock. A phone call about a donor heart comes at any time of the day or night from any location within the zone after which everything has to be quickly co-ordinated and our team rushes to retrieve the heart, transports it to Fortis hospital and the transplant is done all within 6 hours! With patients hailing from distant places outside Mumbai, we have to transport the ill recipient too. So now I recommend patients to

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Editorial



The Things We Take for Granted

Like many of my colleagues, I often prescribe nutritional supplements (vitamins, minerals, antioxidants etc) to my patients empirically. Reasons are varied- I feel my patient will recover faster, the patient has requested for the supplement or I have a vague notion that the patient is deficient in some particular nutrient (without any clinical evidence).

Then one fine day the hospital policy changed! While medical care was free for the beneficiaries, these nutritional supplements were not. This seemed like a perfect jolt to my prescribing complacency. It set me thinking and I decided to write about it. Before writing, I had to start reading! This is what I came across-

- Dietary supplements are not regulated by the FDA, as drugs are. This means that they are not put through the same strict safety and effectiveness requirements as drugs are.
- Nutrients from food sources are more efficiently utilised by the body than isolated substances.
- Supplements are clearly indicated in only 3 groups- Vitamin D for the sun deficient, Vit B12 for vegetarians and the elderly and folic acid for the pregnant.

An article published in the Annals of Internal Medicine in 2013, concluded that supplementing the diet of well nourished adults with most minerals and vitamin supplements has no clear benefit and might even be harmful. An idea that simply does not enter the minds of most people! Fat soluble vitamin supplements can easily result in hypervitaminosis if not regulated. The SELECT (selenium and Vit E) trial showed a 17 % increased risk of developing prostate cancer in men who were put on a daily 400 mg dose of vitamin E orally. Beta carotene supplements have been implicated in an increased risk of lung cancer. Quite a few studies have questioned the role of calcium supplements in improving bone density. The supplements may have cryptic ingredients which may be harmful. Supplements are often added to a prescription and interactions may occur- such as Vit B6 and calcium interfering with some antibiotics and other medications. Vitamin E is known to increase the risk of bleeding –this could turn serious specially during surgery or in patients already on blood thinners.

For me, all this information has put a fresh perspective on a very familiar issue. More is not necessarily better, achieving a balance is! Until more clear research is available regarding single nutrient supplements, a multivitamin supplement having the RDA amount is a better bet.

Sometimes it takes a truly contrary perspective to open up your eyes again- all timely reminders to stop and look anew- at issues, people, assumptions.

The new editorial team and the new format of PULSE aims to do just that. Your suggestions, views, feedback are awaited at pulse @ barc.gov.in.

Dr. Nalini Bhat
Chief Editor- Pulse



Congratulations to BARC Hospital Post Graduates

These students have successfully cleared their post- graduate DNB examinations in 2015



Dr. Shikha Malhotra
(Anaesthesia)



Dr. Ketki Pathak
(Anaesthesia)



Dr. Ram Singh
(ENT)



Dr. Sandhya Bonela
(Obs & Gynaec.)



Dr. Amrut Clothe
(Obs & Gynaec.)



Dr. Sonal Sharma
(Pathology)



Dr. Dina Abhani
(Pathology)



Dr. Premsagar Jadhav
(Surgery)



Medical Division Annual Report – 2015

The Medical Division has been responsible for the functioning of the Contributory Health Service Scheme. This unique scheme has kept pace with the growth of the various units of DAE and their needs, as also with rapid progress in all fields of health care. It is among the very few health care schemes around the country,

which has a personal rapport with not only the working employees but also retired employees and their families.

Over the years, the CHSS has seen a tremendous increase in the number of beneficiaries. The present strength of Mumbai-based DAE Units CHSS beneficiary is 85,780. The total CHSS beneficiaries registered in Hospital Information System is 1, 00,131. The number of retired employees and late employees' families has been showing a steady increase. As advanced middle age and geriatric age groups among the CHSS beneficiaries are on the increase, diseases related to these groups have changed the diagnostic and treatment priorities both at the BARC hospital and at various dispensaries.

The increase in the number of beneficiaries, the rise in the average age, the explosion of new medical technologies, both in diagnosis and treatment have all resulted in an increase in the per capita expenditure, which now stands at Rs.17774/- (2014-15).

BARC Hospital is the referral hospital to all the peripheral dispensaries. BARC Hospital not only caters to the 85,780 Mumbai-based CHSS beneficiaries, but also extends its expertise to the other DAE establishments located around the country. Besides giving out-door and in-house Medicare, BARC hospital provides referrals and arrangements for all those patients who need more specialised treatment and has empanelled super specialists for services in-house.

Keeping pace with the changing trends and methodologies in the field of medicine, BARC Hospital (Medical Division) has introduced in its various faculties, the following new facilities during 2014-15.

o Anesthesia Unit:

- Liquid Medical Oxygen, process of installation is near completion.
- Procured advanced ventilators for Surgical Intensive Care Unit.
- Renovated the manifold room and incorporated an automatic panel.
- Installed Audio-visual alarm for oxygen and nitrous oxide in the main OT complex.
- Part time Intensivist is recruited for SICU.

o Psychiatric Unit:

- A Dedicated Child Guidance Clinic has been started at the Centre for Behavioral Sciences for catering to the mental health needs of children from October-2015.

o Pathology Unit:

- All equipment needed for starting Blood Component facilities at BARC Hospital has been procured and installed. The facility will start after completion of civil work and obtaining necessary licenses.
- Special tests for Dengue, Malaria Antigen, Vitamin D, Homocysteine levels; which otherwise were earlier referred to panel laboratories.
- Various equipment were installed like, Antibiotic sensitivity test, automated coagulation system, Genexpert for M.TB & Rifampicin resistance, Strip reader for Microalbuminuria & Urinary Albumin - creatinine ratio.

o Obstetrics and Gynecology Unit:

- Gynecology Unit has initiated an outreach program of Preventive Gynaec checkup at dispensary level. In the first phase all three dispensaries at Anushakti Nagar have been included.
- A high risk pregnancy clinic has been started apart from normal antenatal checkup clinic
- The work for setting-up of In-Vitro Fertility Clinic (IVF) and treatment has been initiated in Gynecology Unit.

o Dental Unit:

- Speciality orthodontic and pedodontic treatments are available in Dental Unit.
- Dental Unit has installed CBCT machine which considerably helps in implant surgery planning, endodontic treatment and planning orthodontic treatment etc.
- Kharghar Dispensary Dental Unit is scheduled to be operational shortly which will greatly benefit beneficiaries of Navi Mumbai.

o BARC Hospital:

- For New Hospital building approval has been obtained from BMC and concerned authority – Work is expected to commence from April – 2016

(Dr. A.V. Kulkarni)

Head, Medical Division, BARC Hospital.

India needs more General Practitioners than Specialists to Improve its Health Care System

Dr Anuradha Chakrabarty, Deonar E Dispensary

Dr. Aditi Chaudhari, Dept. of Psychiatry



The issue whether we need more general practitioners or specialists in India does not need to be debated. In the context of our country with its

unique demographic and socio economic profile there is no doubt that we need more general practitioners. In spite of rapid urbanisation, 60% -70% of India still resides in the smaller towns and rural areas and in the debate on GP versus specialists, the sharp rural-urban divide in the availability and delivery of healthcare facilities in our country is a reality that is often forgotten. What good it is to do an intrauterine foetal surgery if we are not able to reduce the maternal mortality (174 per 100,000 live births in 2015) or infant mortality rate (38 per 1000 live births in 2015) or prevent diarrheal deaths in the under-five age group?

In today's medical education, commercialised to a large extent, the emphasis is not even on speciality; it is on super-speciality. This race starts right from undergraduate education and students start preparing for entrance exams without attaching importance to the rigorous internship programs practiced earlier. To qualify as a specialist you need five years if you are lucky. To be a super-specialist? Three more! After investing years of hard work and time, it is a reality that most specialists in our country want to work in urban areas. The economic aspect needs to be considered too. The country spends a significant amount on specialising and super-specialising its doctors who then are not willing to work in areas where they are most needed. So investing in a specialist is uneconomical for India where 68 years after independence infectious disease is still a reality and most of its population resides in smaller towns and villages.

Another fallout of this race is that, the students are not learning about holistic medicine. The younger breed is treating the body as separate parts or organs. The GP sees the patient as a whole, is used to looking at all the specialities and organs along with the mind and feelings of the patient. For him there is no division of specialities or super-

specialities. And over the years he is able to treat a patient with gained wisdom in an uncomplicated way. He is less likely to order expensive investigations or prescribe expensive medications. General practice is cost effective.

It is frequently seen that it is the GP and not the consultant who inspires confidence in the patient and wins his trust. He is a 'family doctor' in the true sense. Besides knowing the medical history of each family member, he would often fulfil the role of a confidante and counsellor to whom the family could turn to in times of a medical or even a social problem. (It is not uncommon to be consulted before a CABG or any other surgery of that category!) A good, well informed, conscientious GP who treats ethically, realises his limitations and knows when to refer for higher care, is the important bridge between the patient and the consultant, and not a threat, the ultimate common aim being "cure".

The other important role of the general practitioner is that of providing preventive healthcare. This is true for infectious diseases, lifestyle related diseases or prevention of certain cancers etc. Due to the good rapport between him and his patients and their families, he is best placed to be the effective interface in this regard whether it is in the community based government programs or otherwise.

Maintaining records should be made mandatory and be compiled. This data will be invaluable in strategising 'Health for All' program. 'Swachchata', 'smart villages' and easy availability of basic medicines and investigations can make a GPs life in the village comfortable.

The current doctor: patient ratio is 1:1700 in India while the WHO recommendation is 1:1000. Therefore increasing the number of good general practitioners is the first important step towards filling this gap. Specialists are required no doubt, but definitely in lesser numbers than GPs. They can then have the privilege of focussing their expertise on more complex problems, which are beyond the treatment options provided by a GP. In other words, the base of the pyramid has to be strengthened first. Only then can the structure sustain itself.



The Government of India is committed to the goal of 'Health for All'. The obligation of the Government to ensure access to quality health care for all citizens has been recognized by a number of key policy documents.

The leading causes of mortality in India are cardiovascular disease, lung disease, stroke, diarrheal diseases, pneumonias and infectious diseases, low birth weight, tuberculosis, suicides and accidents and falls. Nine out of the above ten cases require specialist doctors to treat them. India also carries a heavy burden of Diabetes, Hypertension, HIV-AIDS, Mental illnesses, maternal mortality, locomotor and visual disability. These conditions also require the services of specialist doctors.

India has a doctor to population ratio of 1:1700, lagging far behind the international norm of 1:1000. The situation is far grimmer when it comes to specialist services. The statistics compiled by the National Health Mission show that India is facing a debilitating shortage of health specialists, including in basic disciplines such as surgery and medicine in both rural and urban areas. Compared to requirement for existing infrastructure, overall, there is a shortfall of 69.7 % specialists at the community health centres.

Whenever strategic interventions to combat mortality and morbidity are discussed at various forums, the need to increase the number of skilled providers tops the list. There is no doubt therefore that India needs to increase the number of specialist doctors. There are a number of other reasons for this as well.

In an era of evidence based medicine, newer diagnostic techniques and drugs are available each day and management protocols are frequently updated. It is not possible for one doctor to keep pace with all these latest advances in all the different branches of medicine. A specialist could remain more updated on the current trends in his or her field and offer the recommended care.

Most life threatening or debilitating illnesses begin with some relatively innocuous looking symptoms. This may result in a delay in diagnosis and the patient may remain on empirical treatment until it is too late. A specialist, seeing a large number of cases of a specific condition, may be in a bet-

ter position to diagnose these conditions at an earlier stage and institute prompt treatment.

In our country, patients are under the care of different types of doctors. Each follows their own treatment protocol, making any kind of epidemiological and outcome studies from India, very sparse. On the other hand, institutions like the Tata Memorial Hospital which are committed to specialised services do some of the best research work in the country. Thus, if most patients could be treated at specialised centres, it would be possible to maintain and publish accurate data which would be very useful in determining the treatments that are cost effective and best suited for the Indian population.

There is a misconception that specialists cannot function without the support of enormous infrastructure. It is believed that since we cannot afford infrastructure, we don't need specialist doctors

either. I would like to point out that, all the departments of leading hospitals and medical colleges with high end technology and advanced equipments have been systematically set up by dedicated doctors and not vice-versa. The doctor plays the central and pivotal role in setting up health care facilities and hence the appointment of a specialist would have to be the first step in upgrading our health care system.

Lastly, it is important to note that India produces 30,000 doctors, 18,000 specialists annually. This means about half the doctors in India end up without postgraduate seats. This is one of the major reasons of the ongoing brain drain of Indian doctors. Increasing the number of post graduate seats would enable more doctors to complete their education and set up their practice in India itself. This would also increase availability of specialists in rural areas.

On a personal level, each patient wants to be treated by a specialist for their ailment. Yet, when it comes to policy we somehow start believing that we are too poor and too populated a nation to provide specialised services. This mind-set has to change. Treatment that is inadequate, incomprehensive and delayed increases morbidity; reduces quality and it costs just as much. It is a cost we just cannot afford to bear. If we are to reach anywhere nearer to our goal "Quality health care for all" we need to invest in increasing the number of specialists in every field of medicine.



VIEW



COUNTER VIEW

In-House Research

Survey on Hearing Aid Use and Satisfaction in Patients with Age Related Deafness.

Nalini Bhat, Shalaka S. Shewale, Pushkar D. Kasat, Harshada S. Tawade Dept of ENT, BARC Hospital.

Aims: (1) To assess the subjective level of satisfaction in patients of presbycusis using mono-aural hearing aids (HAs). (2) To study various attributes in HA users.

Settings and Design: Prospective. Study period – February 2011 to September 2012.

Subjects and Methods: The study was done in five basic steps: (1) Selection of subjects based on inclusion criteria. (2) Awareness and counseling regarding HAs. (3) Pre-intervention assessment. (4) HA fitting, adjustment and rehabilitation. (5) Post intervention assessment.

Results: There was a high level of satisfaction in terms of hearing benefit (74%) among users at the end of 4 months. Almost half the subjects reported no problems with their HAs. Subjects with mild hearing impairment were less satisfied with their HAs than the others. Most people under used their HAs even when they were satisfied. Subjects with severe hearing loss used their HAs for longer duration daily.

Conclusions: Mono-aural HAs significantly and satisfactorily rehabilitate patients with presbycusis. Mono-aural fitting is a cost effective option, especially in developing countries like ours.



Nerve Stimulator Guided Suprascapular Nerve Block In Treatment of Frozen Shoulder

Dr. Sheetal Chiplonkar, Dr. Adit Palsania, Dept. of Anaesthesiology, BARC Hospital

Introduction

Frozen shoulder (adhesive capsulitis) is a common problem presenting as chronic pain. It is characterised by painful, gradual loss of both active and passive movements at gleno-humeral joint resulting from progressive fibrosis and ultimate contracture of the joint capsule.⁽¹⁾ It may be idiopathic or secondary to trauma or long immobilisation.

Treatment modalities include⁽²⁾

- Non-steroidal Anti-inflammatory Drugs (NSAIDS).
- Physiotherapy.
- Intra-articular steroid injection.
- Suprascapular nerve block (SSNB).
- Surgery.

Clinical course, though protracted and painful, is self limiting. SSNB often used for pain management can be done using ultrasound, fluoroscopy, computed tomography or peripheral nerve stimulator (PNS). PNS is simple equipment used for locating nerves.

We assessed 42 patients, referred from orthopaedic department for conservative management of frozen shoulder, who were given suprascapular nerve block via Meier's approach⁽³⁾ using PNS in the period June 2013 to Jan 2015.

Methodology

- Patients, 30 to 70 yrs of age with shoulder pain of more than 3 months duration with restricted range of motion at the gleno-humeral joint were included.
- Diagnosis was confirmed with MRI scan.
- Post procedure patients were given physiotherapy for shoulder mobilization and were followed up after 1, 3 and 6 months. Shoulder pain and disability index (SPADI) was used for assessment of outcome. A decrease in SPADI score of 25% was considered significant.
- Student t test was used for statistical analysis.

Technique

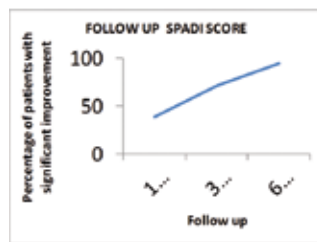
Under aseptic precautions, a point was marked 2 cm cephalad and 2 cm medial to the midpoint of a line connecting the lateral acromion and medial border of the spine of the scapula. A 22G nerve stimulating needle was inserted at an angle of 45° in the coronal plane, with 30° of ventral inclination. After getting appropriate response (abduction + external rotation of arm) block was given with help of 5cc mixture of local anaesthetics with triamcinolone 40mg. (fig. 1)



Fig. 1: Suprascapular block by Meier's approach

Table 1- SPADI scores before and after SSB

	Before SSB	After SSB	P value	Analysis
mean SPADI	62.70	25.67	0.0001	Statistically highly significant
Standard deviation	18.73	15.16		
mean pain index	64.68	23.09	0.0001	Statistically highly significant
Standard deviation	19.45	14.76		
mean disability	59.74	21.80	0.0001	Statistically highly significant
Standard deviation	21.68	15.17		



tendinosis, varying degrees of rotator cuff tear, were often the findings on MRI.

- Observations and outcomes using SPADI scores are tabulated in Table 1.

Result

- The results show a clear benefit from the use of

suprascapular nerve block using a mixture of 40 mg triamcinolone with local anaesthetic. Reduction in pain and disability indices is statistically and clinically significant.

- None of the patients had any adverse effect.
- Significant improvement in SPADI scores (decrease of 25% or more) was found in 40% patients at the end of 1 month, 60% patients at the end of 3 months and all the patients at the end of 6 months.
- Further follow up of residual pain/disability was irregular and hence could not be statistically analysed.

Conclusion

- Suprascapular nerve block by Meier's technique using PNS is a safe and effective treatment for patients with frozen shoulder. It is technically easy, can be performed in an outpatient department and is an alternative to prolonged oral and intra-articular pharmacotherapy. Minimal residual pain may require prolonged followup in a few patients.

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In-house Medical Data

Dengue Data from BARC Hospital-2015

Compiled by Dr. Shobha Nair, Editor, Pulse

Today, Dengue ranks as the most important mosquito-borne viral disease in the world. Dengue infection is caused by the transmission of one of the four dengue virus serotypes (DENV1, DENV2, DENV3 and DENV4) to humans through the bite of *Aedes Aegypti* mosquitoes.

Data obtained from the Dept. of Paediatrics, BARC revealed that of the 739 paediatric admissions in 2015, 40 children (5.4 %) were diagnosed to be suffering from Dengue fever. 32 children of the 40 had simple dengue fever while 8 had complications or severe dengue. Five children had Dengue Haemorrhagic Fever. Seven children needed ICU admission and monitoring. Three children required platelet transfusion. All the 40 children were managed in our hospital and recovered completely.

Data from Dept. of Medicine revealed that 141 admissions were for dengue fever in 2015. Of these, 7 patients required platelet transfusion while 4 patients were transferred to tertiary care centre for management. All the patients had a successful recovery.

According to the World Health Organization, the incidence of dengue globally has shot up 30-fold in the past 50 years. Uncontrolled urbanization, climate change and limited resources are some of the important factors in the spread of this disease. The Social Determinants of Health described as related to dengue are water resources, sanitation, poverty and migration.

Although the first mention of occurrence of dengue in India is said to be in 1780, the first confirmed outbreak occurred in Kolkata in 1963-1964. It took almost 30 years for dengue to eventually spread throughout the entire country, resulting in the first major nationwide outbreak of

Dengue Hemorrhagic Fever in the year 1996. Following this, gradual dengue virus expansion started in the entire nation, and northern parts of India faced yet another outbreak in 2003. A dramatic increase in the number and frequency of outbreaks followed, and, at present, in most of the states of India, all four serotypes are prevalent and is endemic in our population.

A recent study done at the University of Oxford using a map-based approach to model how many dengue cases were occurring in various parts of the world, estimated that India had the largest number of dengue cases, with about 33 million apparent and another 100 million asymptomatic infections occurring annually.

An October, 2014, study published in the American Journal of Tropical Medicine & Hygiene, and done by researchers at the Brandeis University, MA, USA, showed that the annual number of dengue fever cases in India could be 282 times higher than the number officially reported, and "the disease inflicts an economic burden on

the country of at least US\$1.11 billion each year in medical and other expenses".

The clinical spectrum ranges from unapparent to severe forms and fatal outcomes. Every year around 20,000 deaths are estimated to occur in more than 100 countries. In general persons of all age groups sustain dengue infections in India. Young adults (21-30 yrs) are the major group affected. However, children suffering from dengue hemorrhagic fever have a high mortality. Mortality from Dengue can be reduced to almost zero by implementing timely, appropriate clinical management.

Standing water is a breeding ground for mosquitoes. Preventive strategies focus on effective vector control measures. A large-scale clinical trial (Phase 3 trial) to evaluate whether a candidate vaccine can prevent dengue fever has been launched in Brazil. The vaccine, TV003, was developed by scientists in the laboratory of Stephen Whitehead, Ph.D., at NIH's National Institute of Allergy and Infectious Diseases (NIAID).



Breast Cancer Screening in Indian Context



Dr. Anita Gadgil, Dept. of Surgery
Dr. Surita Kantharia, Dept. of Radiology, BARC Hospital

In spite of the world wide rising incidence of breast cancer, India has a low incidence as compared to the Western countries.

(Northern America breast cancer incidence is about 90/100,000 as against 25-30/100,000 in India)⁽²⁾. In the Western world, mammography screening every two to three years in women from 50-69 is recommended as they have high incidence (almost 3 times as compared to incidence in India)⁽²⁾.

Breast Health Global Initiative (BHGI) has recommended screening by increasing breast awareness, early detection and comprehensive treatment for India, as most of our women present with large tumors.⁽³⁾In the Indian Health care System, establishment of programs that promote early detection, accurate diagnosis and prompt treatment is a top priority⁽⁴⁾. Mammography is not recommended for mass screening in India.

Role of Mammography in Indian breast cancer scenario

Mammography is a specialised medical imaging that uses low dose X-ray system to examine the human breast. It is used as a diagnostic and screening tool. **Diagnostic mammography** is performed for women who present with breast complaints such as breast lump, pain, skin changes or nipple discharge. **Screening mammography** is performed in women who have no signs or symptoms of

the disease but are at high risk of developing breast cancer.

Factors associated with increased risk of female breast cancer are –

1. Older age
2. Early menarche and late menopause.
3. Nulliparity or 1st full term birth at advanced maternal age.
4. Woman already known case of Breast, Ovarian or Uterine cancer.
5. Family history of Breast or Ovarian cancer especially in 1st or 2nd degree relative.

Other important risk factors are –

1. Absence or shorter duration of breast feeding.
2. Prolonged or unsupervised use of HRT after menopause.
3. BRCA 1/2 mutations.

Life style factors like high fat diet, obesity, increased alcohol intake and reduced physical activity are also associated with risk of breast cancer.

Recommendations for Screening for Effective Breast Cancer Prevention and Early Diagnosis

1. Women age 30-39years-

Breast Awareness, Clinical Breast Examination and Education regarding Breast Self Examination.

2. Women age 40-49years-

Women with **high risk** need annual clinical breast examination, a baseline mammography. Mammography can be repeated if any interval change is noticed.

Women with **average risk**: Breast Awareness and Education supplemented with clinical breast examination. In case of positive clinical findings, breast sonography recommended. Breast sonography is especially helpful in women, 40-49years age, with dense breasts where mammography is less sensitive.

In case of benign pathology, yearly follow up is suggested to assess stability of the lesion and to look for interval change.

3. Women age 50-69years

Women with **high risk** need detail clinical breast examination, Breast Sonography and Mammography every two to three years.

Women with **average risk**: Breast Awareness, Clinical Breast Examination and Screening mammography is done if clinically indicated.

The **Breast Awareness Programme at BARC Hospital** was initiated in 2013 with aim to invite women to come for clinical breast examination and to have a protocol for evaluation and treatment of breast cancer. The primary early detection methods for breast cancer in our programme include

- Patient Awareness
- Patient Education with regards to screening methods such as Breast Self Examination, Clinical Breast Examination, and
- Breast imaging which includes Breast Sonography and Mammography.

At BARC hospital, **Breast Imaging Mammography** service was started on 31st May 2010. 1265 patients have undergone mammography in the period from May 2010 up to November 2015.

700 mammographies have been done since the beginning of the Breast Awareness program.

542 diagnostic and screening mammographies were done and 61 cancers were diagnosed.

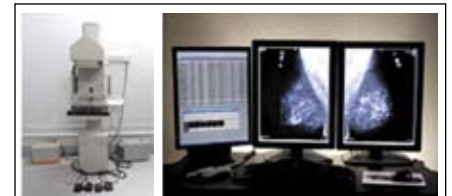


Fig. 1: Mammography Machine at BARC with CR monitor

The results of the Breast Awareness Program at BARC Hospital show that 82% of the breast cancers diagnosed since the implementation program, are **Early** tumors (up to stage 2a). The need for chemotherapy in these early tumors has reduced from 88% to 60% in last two years.



Fig. 2: Normal Mammogram

Increased breast awareness, early detection, optimised use of mammography and comprehensive treatment is expected to further improve breast cancer outcomes BARC.

BREAST AWARENESS is the way forward.....

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Medical Division News

Some Achievements

Our Academic Achievers!

- **Dr Dina Abhani**, DNB Pathology, won 1st prize in PG quiz in TNMC Haematology CME 2015 on April 26, 2015.
- **Kishore Kudikala**, Pathology Department was awarded a consolation prize in Safety Poster Contest-2015, held at BARC.
- **Dr Kanchan Bantwal**, Deonar (W) dispensary presented "A case study on cutaneous presentation of Megaloblastic Anemia" in the case presentation competition, conducted by GPA-Greater Bombay on 19th December 2015, which secured second prize

The Sports Winners!

- **Kaushik Satose and Prashant Manapure** participated in Cricket tournament of Capital Corporate League held at Wankhede Stadium. They won the final match of their division.
- **Akashdeep Huriwal**, Pharmacy participated in Inter-Division Football. In Year 2015 their team was Runner-up and recently in 2016 won the Winner's trophy.
- **Prasanna Darade**, Dental Unit participated in 30th & 31st DAE Sports & Cultural Meet, during 2015. His team won the Table Tennis Championship on both the occasions. He was also selected to participate in the National event based on departmental ranking of top 5 players.
- **Dr.Urmila Peshoton**, OYC Dispensary participated in 42.2 Km Bangaluru Marathon held in Oct-2015 where she got 9th rank in her category. She also completed Goa River Marathon of 21.1 km held in Dec-2015

Our DAE Award winners!

- **Dr. Susan Cherian**, Head Pathology, was awarded the DAE Science & Technology Excellence award 2014 for Medical care & Ethics.
- **Mr.R.S.Palwankar**, Asst., Hospital Admin., was awarded the DAE Meritorious Service award 2014.

International Training Program/Meeting attended:

- **Dr. Anita Gadgil** and **Dr. Suritha C. Kantharia** attended the meeting on "Screening for Breast Cancer" for compilation and evaluation of data on breast cancer, organized by the International Agency for Research on Cancer - IRAC in Lyon, France. from 02.11.2015 to 12.11.2015.
- **Dr. A.V. Kulkarni**, Head, Medical Division attended the NIRS Training Course on Radiation Emergency Medicine in Asia-2015 from 07 to 09 Dec. 2015 in Chiba, Japan.



Dr. Susan Cherian Receiving DAE Scientific and Technical Excellence Award 2014



Mr. R.S. Palwankar receiving DAE Meritorious Service Award 2014.



Akashdeep Huriwal, Winners trophy Inter-Division Football



Dr. Urmila Pesholon, at Marathon



Dr. Dina Abhani (1st prize in PG quiz)



Kishore Kudikala, Safety Poster contest-2015: Consolation prize



BARC (Ajanta): Men Team-Winner L to R: S/Shri. R.V. Chavan (Rod), S.V. Chavan (PD), V.G. shelar (RRDPO), P.K. Darade (MD) and V.s. Ingle (HWD)



Winners of Final F division of capital T20 cricket tournament organized by Fair PlaySports management held at Wankhede stadium, Mumbai

continued from pg 1....

Heart to Heart - with Dr. Anvay Mulay...

stay in Mumbai while they are awaiting a donor heart.

ET: Doctor, tell us more about the Heart Failure Clinic.

AM: Patients suffering from heart failure secondary to any cause are followed up closely in the Heart Failure Clinic. Patients are at different levels of criticality. There are instruments available to gauge the severity of heart failure and fairly predict the survival period i.e. how long a patient can sustain without a transplant. At one stage patients are counseled about the option of a heart transplant. The Heart Failure Clinic gives us data of patients who are likely to need a transplant. Willing patients from this clinic are registered for transplant with the Zonal Organ Transplant Committee.

ET: Who needs a heart transplant? How large is the need?

AM: Patients with heart failure who are no longer responding to medical line of management need a heart transplant. In our clinic at Fortis, we have 10 patients in different levels of criticality. With news spreading about the successful transplants being done here, many patients from outside Mumbai are visiting us. I think as awareness spreads, cardiologists are likely to offer this option to many more patients in this part of the country. In the south- in Kerala, TN and AP heart transplants are done regularly since many years. Due to high awareness and acceptance of concept of organ donation, the donor list is often bigger than the needy recipients.

ET: How are patients prioritized on the

waiting list? How long is the waiting period?

AM: There is a Zonal Organ Transplant Committee which scrutinises the entire procedure of all organ transplants in that zone. The waiting list is strictly on the first come first basis. Both the donor and the recipient have to be from the same zone. The date and time of registration determines the priority. However once a donor heart is available, there are a lot of medical factors which determines compatibility of the heart. So it is possible that though the person is higher up on the waiting list the heart may not be suitable for him and may be ideal for a patient lower down in the waiting list. Sometimes urgency in seriously ill patients has to be taken into consideration. However, money is not a consideration for giving priority.

ET: What factors determine the donor-recipient compatibility?

AM: Blood group match is mandatory. If the donor is O Rh positive (universal donor), it can match any blood group recipient. Then the first waitlisted person is considered.

Heart size should also match. Body weight gives a rough estimate of the heart size. Weight of the donor and recipient should not ideally differ by more than 10-15%. Also, the age difference between the donor and recipient should not be too large.

ET: What would be an ideal donor heart?

AM: World over, heart is harvested for transplant from a brain dead patient. The usual reasons for brain death are patients suffering from brain hemorrhage, tumors/cancers of the brain or road traffic accidents. Patients who had a medical history of

serious cardiac disease are excluded. It's only in one centre in Australia, where even after the heart stops beating, the heart is harvested within few minutes and successfully transplanted.

ET: What is the prognosis of HT patients?

AM: Research reveals that at the end of 5 years after transplant almost all patients are able to perform the activities that they used to do before the illness. At the end of 10 years, 80% are active and independent in activities of daily living. The longest survivor was a patient who had a heart transplant at the age of 32 years, lived for 36 years post-transplant and died recently.

ET: What is the cost involved in HT?

AM: At present the transplant procedure can cost anywhere between 15-20 lakhs. Location of the donor heart may vary the transportation cost. More than the one time cost, life- long immunosuppression agents can cost approx. Rs.12, 000-15,000 per month. Some state governments, e.g. Kerala and Tamil Nadu have significantly subsidised the cost of immunosuppression therapy, thereby reducing the financial burden of the recipient.

ET: What is the role of the Government and the administrative machinery?

AM: The involvement and support of the government can increase awareness, highlight the significance of quick transport and ease the process of heart transplant. Subsidising cost of treatment can benefit many needy patients. Tests and investigations have to be done on the brain dead patient for determining suitability of donor organs. It is a practice in many places that all the costs incurred after consent for organ donation is

obtained, is borne by the recipient.

The TamilNadu government has made it legally mandatory for doctors to document brain death since the 1990s. The causes of death in post-mortem reports / death certificates have to clearly specify if the patient was brain dead.

ET: What's your message to the health care workers?

AM: I feel that if all medical professionals learn to diagnose and document brain death, it can pave way for more families consenting for organ donation after appropriate counseling. The social worker co-ordinators who approach brain dead patients' relatives have to sensitively counsel regarding organ donation. I suggest that they should not influence relatives to donate a specific organ. It is better that the relatives consent for donating any of the organs that are found suitable. Sometimes relatives give selective consent for heart donation. But when the team investigates medically, the heart is not suitable for donation but the liver and cornea are. Thus, suitability of any donor organ has to be medically ascertained.

I would also like to tell everyone that more than a pledge or a donor card it is important to inform and convince our near and dear ones the wish to donate organs if we become brain dead. This will help our relatives to decide easily and give consent in their time of grief.

ET: With this challenging, hectic work schedule how do you unwind, doctor?

AM: (Laughs) "When I operate on the table, I meditate. Those hours are my true relaxation time."

Delivering in a Mumbai Local-How we did It!!

Mini Taju & Sallimol Saju, Staff Nurses, BARC Hospital

On 4th of August 2015, as on other days, we caught our 8.42am CST local, heading for our Nursing lectures at J. J Hospital, Byculla. Suddenly we heard a commotion from the otherside of the jam packed compartment. The reason being, a 21 yrs. old lady was in labour pains, and her family was desperately seeking help. We promptly proceeded towards the scene while people miraculously made way for us!

We realized it was a case of imminent delivery and immediately took charge. We said a quick prayer asking Him to be with us and to help this lady deliver smoothly, without any complications. While conducting the delivery, we took the patient's medical and obstetric history realising that this was the lady's second delivery- the first being normal vaginal delivery. We thanked Him again for small mercies! Performing this delivery brought memories of our rural community nursing experience, but, here the setting was very, very different! Remembering our principles of Maternal Health Nursing we tried to help the mother deliver safely, with minimum contamination to mother and baby.

"Yeh Hai Mumbai Meri Jaan" this quote came true when, while the child was on the verge of being delivered, we got a dupatta, a hairclip for clamping the cord, plastic bag for

collecting the placenta, and cleaning material etc! It was amazing how all these things were magically provided to us by our fellow commuters. Child was delivered in an instant, covered and at Sewri station, we got down and contacted the motorman, who in turn contacted the CRPF official Mr. Mahajan. From there it was a flurry of activity, one of us ran with the baby in our arms to the nearest Sewri hospital. The other took the new mother, her old mother in-law, another child and their belongings and walked to the hospital as fast as was possible. Medical help was given there and later the mother and baby were shifted to KEM Hospital for further management. After ensuring that they were in safe hands, we left for our classes in a daze at the turn of events.

Only later did we realize the enormity of the situation on that day on the train. Conducting a delivery with bare hands, without any equipment and not landing up in any complications or mishaps was nothing less than a



(L to R) Sallimol Saju, new mother, Mini Taju holding the newborn

massive stroke of luck. We could achieve it only with the blessing of God and the help of good Samaritans. Unlike all things which come to an end, we had more goodness in store for us. At our work place, congratulations and appreciations kept pouring in. There was also a felicitation function at our hospital where the Director BARC sent his letter of appreciation, read out by the Head, Medical division. Not to forget, our photos and names appeared in the city's leading dailies!

These precious moments will be cherished by us throughout our lifetime. We have only one message to give to our community, that, we Nurses are always happy to be there for you, 24x7.

Rapid Molecular Detection of Tuberculosis by the GeneXpert MTB/RIF System

Dr. Raji Pillai, Dr. Susan Cherian, Dr. Uma Chaturvedi, Sofia Patel, Umesh Gami, Dept. of Pathology, BARC Hospital

With a global estimated 9.6 million new cases and 2 million deaths every year, tuberculosis (TB) remains a leading health problem worldwide¹. India has the highest burden of TB, with recent WHO statistics giving an estimated incidence of 2.1 million and an estimated TB prevalence of 2.6 million¹. Most of the national TB statistics for India is obtained from RNTCP (Revised National Tuberculosis Control Programme) which was started in 1997.

Lack of a rapid and sensitive technology to accurately diagnose tuberculosis and its drug resistant forms, contributed to the global burden of the disease. Although pulmonary tuberculosis is the most common form of the disease, there is also a significant number of extra-pulmonary tuberculosis. Adding to these issues is the prevalence of tuberculosis in HIV positive individuals and the emergence and spread of multidrug (MDR) and extensively drug resistant (XDR) tuberculosis.

The most widely used method to detect TB in endemic countries is sputum smear microscopy. This test has low sensitivity and further methods are required to detect drug resistance. Culture is the gold standard for diagnosis of TB; however mycobacterium culture and drug susceptibility testing (DST) is a slow and cumbersome procedure requiring 6-8 weeks². During this time patients may spread the infection, including the drug resistant strains and amplification of resistance may occur. These tests also require extensive laboratory infrastructure and sophisticated biosafety level.

The introduction of molecular methods through nucleic acid amplification (NAA) tests has overcome the low sensitivity of conventional screening methods like sputum smear acid fast bacilli (AFB) detection and the delay associated with conventional and liquid culture methods. The identification of mutations associated with drug resistance depends on additional NAA tests, whose application on clinical samples is indicated only for AFB positive specimens³.

One of the molecular methods is the GeneXpert MTB/RIF assay, which was intro-

duced in 2004. It uses hemi-nested real time PCR to amplify *M.tuberculosis* specific sequence of the rpoB gene. To determine rifampicin (RMP) resistance, the rifampicin resistance determining region of the rpoB gene is probed with molecular beacons. The assay is carried out in a fully automated manner with the use of a disposable cartridge that holds the PCR reagents and hosts the PCR process, including bacterial lysis, nucleic acid extraction and amplification and amplicon detection.

Many studies have assessed the GeneXpert MTB/RIF test on sputum and other respiratory samples as well as extra pulmonary samples. These studies have consistently shown significantly better sensitivity compared to other conventional methods for both pulmonary and extra pulmonary specimens. A review of the reported studies is done here to assess the utility and significance of the Xpert assay in clinical specimens.

Table (1) gives a summary of various reported studies using the GeneXpert MTB//RIF system for detection of tuberculosis in pulmonary and extra-pulmonary samples.

The Xpert MTR/RIF assay in most studies has demonstrated a high specificity for RMP resistance detection. However, false resistance has been reported in few studies. Hence confirmation by culture

and conventional drug sensitivity testing is necessary.

The average time to diagnosis of tuberculous infection and time to RMP sensitivity testing is as given in **table (2)**. Reduced time to diagnosis and RMP sensitivity testing can effectively reduce the time to initiation of treatment which can be of significance in reducing the global burden of tuberculosis and also preventing treatment drop-outs due to delayed detection of drug resistance.

The biosafety precautions for performing Xpert MTB/RIF assay are equivalent to the requirement for performing direct sputum smear microscopy. As the molecular detection process is automated, complicated manual methods of nucleic acid amplification (NAA) procedure are overcome and hence minimal training is required. This testing is launched as part of RNTCP programme at district level and is endorsed by WHO for sputum negative tuberculosis⁶.

In conclusion, the GeneXpert MTB/RIF is a fully automated cartridge based molecular test to detect simultaneously Mycobacterium tuberculosis infection and rifampicin resistance. Rapid Diagnosis is the most important utility of this test as that would result in prompt initiation of treatment and thus prevent spread of infection in the community. It does not replace

Mycobacterial culture and conventional smear microscopy. Mycobacterial culture needs to be done for species identification and for drug sensitivity against 1st and 2nd line of drugs. Smear microscopy continues to play an important role in the diagnosis of TB as well as monitoring treatment response. As GeneXpert is an expensive test it has to be used judiciously. The overall utility of this test in rapid and early detection and hence treatment outcomes needs to be evaluated with follow up studies.

Table (2): Average time for tuberculosis detection and RMP resistance testing⁴

Assay Method	Time to diagnosis	Time to detect RMP resistance
GeneXpert MTB/ RIF	0-1 day	0-1 day
Smear microscopy for AFB	0-1 day	-
Solid culture	23- 43 days	-
Liquid Culture	13- 21 days	30-124 days
Line probe assay	-	10-26 days

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Table (1): Comparison of sensitivity and specificity of GeneXpert MTB/RIF assay in studies reported in literature.

Reported studies	Sample size (N)	No. of culture positive cases	Smear AFB Positive cases (%)	Gene Xpert MTB/ RIF positivity (%)	Gene Xpert assay specificity	Sensitivity in smear negative, culture positive samples
Boehme et al ⁴	6648 (pulm*)	1033	67.1%	90.3 %	99 %	76.9%
Doris Hilleman et al ⁵	521 (ex-pulm*)	62	9.7%	77.3%	98.2%	-
Loannidis et al ³	106 (pulm* & expulm)	35	0%	91.4 %	93 %	91.4 %
Arzu N. Zeka et al ²	pulm*- 253 ex -pulm*- 176	58 31	46.6 % 12.9 %	79.7 % 63 %	98.2 % 100%	68.6 % 47.7 %

*pulm- pulmonary samples, ex- pulm- extra- pulmonary samples

In-House Research

Study of the Clinical and Functional Outcome of Primary Total Knee Arthroplasty in Patients above 70 Years

Dr. Viral Sankhesara, Dr. Nandan Kamat, Dr. Vijay Sadulwar, Dept. of Orthopaedics. BARC Hospital

Total Knee Arthroplasty /Replacement (TKA/TKR) is now a reliable treatment for severe arthritis of the knee. The Knee Society Score System (KSS) is a dual rating system (assessing the clinical and functional outcome) that eliminates the problem of declining knee scores associated with patient infirmity.

Aim: To study the clinical and functional outcome of primary TKA in patients above 70 years of age using the KSS.

Methods: A total of 38 patients aged above 70 years with primary osteoarthritis fulfilling all the inclusion criteria who underwent TKA surgery were selected for the study during the period from January 2014 to December 2014. They were assessed 6 weeks post operatively for any signs of infection. Then they were assessed clinically, functionally and radiologically using the Knee Society Score at an interval of 3 months and 6 months post-operative.

Results: 42% of our patients were aged between 70-74 years with mean age of 76.47 years. There was a female predominance in the ratio of 1.4:1. The average pre - op Knee Society Clinical Score (KSCS) was 27.42 which improved to an average post - op score of 95.29. Using the KSCS, of the 38 patients assessed, 34 patients (89%) had Excellent and 4 patients (11 %) had Good results. The average pre-op Knee Functional Score (KFS) was 42.82 which improved to an average post - op score of 85.50. Using the KFS system, of the 38 patients assessed, 30 patients (79%) had Excellent, 5 (13%) had Good and 3 (8%) had Fair results. The difference between the means of pre-op KCS and post-op KCS was 67.87, which was statistically significant (66.09 to 69.64, 95% CI: P<0.001). The difference between the means of pre-op KFS and post-op KFS was also significant - 42.68 (39.51 to 45.85, 95%CI. P value <0.001).

Conclusion: Primary Total Knee Arthroplasty improves the functional ability of old patients above 70 years and the ability of the patient to get back to pre-disease state, which is to have a pain free, mobile joint.



Case Report

Iatrogenic Hypervitaminosis D causing Acute Pancreatitis

Dr. Jayesh Kalbhande, Dept. of Surgery, BARC Hospital

Introduction

Vitamin D deficiency is commonly seen in those not exposed to sunlight and in vegetarians. The skin produces vitamin D only after sunlight exposure. Food sources are not enough to maintain levels of the vitamin. Recent studies have shown that vitamin D deficiency is associated to an increased risk of developing cardiovascular diseases, some types of cancer, and certain inflammatory and autoimmune diseases. Hypervitaminosis, is known to occur with over prescription but complications associated with hypervitaminosis D are rare. Therefore this case report of Hypervitaminosis D causing acute pancreatitis is presented.

Case report

A 65 years old hypertensive lady presented with acute onset, severe, upper abdominal pain, constipation and vomiting since 4 days. 1 month ago she had reported with vomiting and dysphagia without abdominal pain. At that visit her abdominal examination and Upper GI endoscopy were normal. So she was managed conservatively with proton pump inhibitor and antiemetics.

At this visit, she was vitally stable. On palpation, abdomen was soft, with tenderness elicited in epigastric region. On admission, WBC counts were 10,500/cmm, hemoglobin was 10.2 gm%. Liver function tests were normal. Serum creatinine was 1.2 mg%. Serum electrolytes were normal. Serum amylase and lipase were raised - 622 U/L and 352 U/L respectively. Based

on these, a diagnosis of acute pancreatitis was made. USG abdomen did not show any gall stones. Patient was managed conservatively with intravenous fluid and pain management but was not relieved.

CT abdomen was done to assess the acute pancreatitis. It showed non-necrotic acute pancreatitis and osteoporotic changes in L2-L5. CT brain, done to rule out any intracranial cause of persistent vomiting and dysphagia, was normal. Patient was investigated for causes of pancreatitis. Serum calcium level was markedly raised to 13.3.mg%. further investigations to assess hypercalcemia revealed low serum PTH level of 11.05 pg/ml (N=15-68.3) and markedly raised vitamin D levels of 160 ng/ml (N= 30-100).

Hypercalcemia can be part of a paraneoplastic syndrome, in certain malignances, such as carcinoma of lung and renal cell carcinoma. It can sometimes be secondary to osteolytic metastatic lesion in bones. Hence a PET and bone scan were done, which were normal. Based on above finding it was concluded that she is having hypervitaminosis D causing hypercalcemia and acute pancreatitis.

She was given intravenous normal saline and injectable furosemide to reduce the serum calcium levels and pancreatitis was managed conservatively. Her serum calcium level did not reduce and her pain also did not come down. In view of same, single dose of intravenous injection of zoledronic

acid 4 mg was given. After this serum calcium levels dropped down to 9.3mg% and her pain in abdomen also got resolved. She was not given any specific treatment for hypervitaminosis D as it is a fat soluble vitamin and there is no medication available to cause excretion of vitamin D.

Reviewing the history, revealed that 8 month back the patient's Serum vitamin D level were detected to be low. She was supplemented with injectable as well as oral Vitamin D. In view of this, the persistent vomiting and dysphagia, with which she had presented 1 month ago, were probably secondary to hypervitaminosis D. Her vitamin D supplements were now stopped. On 6 months follow-up, she remained asymptomatic with no vomiting or pain in abdomen.

Discussion

The commonest cause of hypervitaminosis D is over prescription. It can also be found in case of consumption of vitamin D with medication such as thiazide diuretic and digoxin. Increased Vitamin D levels are found if Vitamin D supplements are taken in presence of diseases such as tuberculosis, sarcoidosis, renal failure and liver failure.

Since, hypervitaminosis D is a rare condition, the complications associated with it are also rare. Hence, this is the first such case reported in literature, for hypervitaminosis D causing hypercalcemia and pancreatitis.

Clinical manifestations of vitamin D toxicity are hypercalcemia, hypercalciuria, kidney stones, nausea, vomiting, anorexia, constipation, headache, and hypertension. In a recent paper Pandita et al. reported a case series of 15 patients with iatrogenic symptomatic hypercalcemia in whom toxicity occurred due to empirical excessive administration of vitamin D by oral and parenteral

route. To prevent iatrogenic vitamin D toxicity the authors suggested that awareness should be increased among healthcare providers regarding the toxic potential of mega doses of vitamin D, despite its wide margin of safety. In another case series, Koul et al. reported 10 cases of hypercalcemia due to vitamin D intoxication with features of vomiting, polyuria, polydipsia, encephalopathy and renal dysfunction. All the patients had demonstrable hypercalcemia and vitamin D levels were high in nine of the 10 cases. The patients had received high doses of vitamin D and no other cause of hypercalcemia was identified. Treatment of hypercalcemia resulted in clinical recovery in nine cases.

Conclusion

Persistent vomiting can be a rare presentation of hypervitaminosis D. Hypervitaminosis D can cause hypercalcemia resulting in acute pancreatitis. The hypercalcemia secondary to hypervitaminosis D and pancreatitis responds quickly to calcium lowering treatment with biphosphonate. Vitamin D deficiency is very common however one should be judicious in supplementing vitamin D. There is a need to avoid over prescription of Vitamin D to avoid hypervitaminosis D.

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Patient Education

Rehabilitation after Total Knee Replacement

Dr. Krishna Meena, Dept. of Physiotherapy, BARC Hospital

Recovery during the first few weeks after total knee replacement determines the final outcome of surgery. Hence appropriate rehabilitation measures play a crucial role in recovery.

Goals of rehabilitation

- Prevent hazards of complete bed rest e.g. - Deep Venous Thrombosis, Pulmonary Embolism, Pressure Ulcers.
- Reduce pain, swelling, inflammation.
- Increase range of motion at the knee joint. Gain 110-115 degree Knee flexion.
- Regain strength of the thigh and leg musculature.
- Assist patient in achieving functional independence in activities of daily living.
- Improve confidence, balance and quality of life.

Do's and Don'ts after surgery

- Icing your knee for 10-15 minutes 2-3 times a day can help lessen pain. Pain will gradually subside and is usually

only mild after six weeks.

- Elevation of the leg can help reduce the swelling. Do not keep pillow right under the operated knee to avoid flexion deformity.
- Avoid getting your incision wet to prevent infection or delayed healing of the wound.
- Joint motion and muscle strengthening exercises to be done multiple times in a day.
- Use walker for 3-4 weeks, then shift to a walking stick.
- Climbing staircase is recommended after 2 weeks.
- Physical therapist may recommend that you exercise approximately 20 to 30 minutes two or three times a day and walk 30 minutes during your early recovery.
- Tips for walking: Advance your walker or crutches a short distance; then reach forward with your operated leg with your knee straightened so the heel of your

foot touches the floor first. As you move forward, your knee and ankle will bend and your entire foot will rest evenly on the floor. As you complete the step, your toe will lift off the floor and your knee and hip will bend so that you can reach forward for your next step. Remember, touch your heel first, then flatten your foot, then lift your toes off the floor. You can eventually walk without an aid.

- Climbing and Descending Stairs: The ability to go up and down stairs requires strength and flexibility. At first, you will need a handrail for support and will be able to go only one step at a time. Always lead up the stairs with your good knee and down the stairs with your operated knee. Remember, "up with the good" and "down with the bad." You may want to have someone help you until you have regained most of your strength and mobility. Stair climbing is an excellent



strengthening and endurance activity. As you become stronger and more mobile, you can begin to

climb stairs foot over foot.

Activities that can be done after TKR

- Walking, cycling, swimming, and light weight low-impact aerobics, hiking.

- Driving can be resumed after 6 weeks of surgery.

Activities that are to be avoided after TKR

- Any high impact sport or exercise program. Specifically, basketball, baseball, football, soccer, running, rock climbing etc.

Resuming one's job

Usually about 6 to 8 weeks after the operation. Some patients do return earlier, depending on the nature of their work.

Data from Physiotherapy department at BARC Hospital

227 patients have been rehabilitated between March 2009 and Nov 2015. 146 amongst them had undergone bilateral TKR.

- It was observed that recovery is faster in patients who undergo replacement of one knee as compared to both knees. Patients with bilateral TKR took 4 to 6 weeks to walk without walker while patients with unilateral TKR took 2-3 weeks to walk without walker.
- Most of the patients were followed up 3 months and 6 months post op and had shown good recovery in terms of pain relief, improved quality of life and independence in activities of daily living.



A Case Study of Megaloblastic Anaemia-Pictorial Report

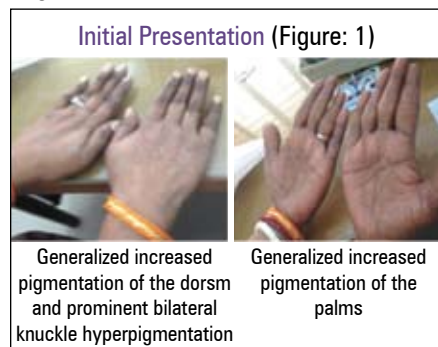
Dr. K.R. Bantwal, Dr. A.V. Kulkarni, Deonar West dispensary, BARC

Initial Presentation

53-year, house wife, presented with gradually progressive blackish discoloration of skin over the dorsum of proximal interphalangeal and distal interphalangeal joints of both hands for the past three months, associated with history of worsening fatigue, dyspnea on exertion, weight loss, loss of appetite & general weakness. No history of fever, loose stools, steatorrhea, diabetes mellitus or tuberculosis. She was a vegetarian and gave no history of any chronic drug intake.

Examination

Patient was pale, had no icterus, glossitis, lusterless hair and no hepatosplenomegaly. Neurological examination was normal. Characteristically the patient had prominent bilateral knuckle hyperpigmentation (Figure 1).



Investigations at Initial visit

- Haemoglobin 10.1 g/dl, Mean Corpuscular Volume (MCV) :108.9fl,

- Mean Corpuscular Haemoglobin Concentration (MCHC): 33.1g/dl.
- The peripheral blood film revealed macrocytes.
- LFT: WNL.
- Serum folate levels : 1.7ng/ml (normal 3.6-20ng/ml)
- Serum cobalamin levels: 116pg/ml (normal 180-900pg/ml).
- Serum Cortisol & TSH: WNL,
- Anti HIV 1 & 2 (AIDS): Negative.

Diagnosis

Vitamin B12 & folate deficiency anaemia secondary to nutritional deficiency.

Treatment

Oral replacement haematinic, folic acid 5mg daily with methylcobalamin 1500mg daily in addition to nutritional counselling.



- Haemoglobin: 12.6g/dl.
- MCV - 85fl
- MCHC was 33.2g/dl.
- The peripheral blood film revealed macrocytes.

- Serum folate levels >24ng/ml
- Serum cobalamin levels 335pg/ml



- Haemoglobin 12 g/dl.
- MCV 82.3fl
- MCHC 32.3g/dl.
- The peripheral blood film revealed normocytic normochromic picture.
- Serum folate levels >24ng/ml
- Serum cobalamin levels 401pg/ml
- Serum iron levels were 59 mg/100ml.

Monitoring Response to Therapy

The haemoglobin should rise approximately 1 g/dl each week. If the haemoglobin does not rise appropriately and is not normal within 2 months, other causes of anaemia, such as iron deficiency, should be considered. Iron deficiency can occur in the course of treatment due to the consumption of iron stores for RBC production. The development of iron deficiency can impede the response to cobalamin or folate therapy.

Discussion

Hyperpigmentation of skin, especially knuckles, has been reported as a manifestation of vitamin B12 deficiency. Only occasionally, as in the present case, has it been reported as a presenting manifestation of B12 deficiency.^[1] The pigmentation can also involve nails and is reversible with supplementation of vitamin B12. The exact

mechanism is not known but is believed to be a result of increase in melanin synthesis in B12 deficiency.^[2] Generally vitamin B12 deficiency is seen in nutritionally poor diet in low socio-economic groups, vegans and vegetarians, pernicious anaemia, chronic drug intake (e.g. phenytoin and acid-suppressing medication), increased requirements during growth and pregnancy and in malabsorption syndromes.^[3] In our patient, combined folate and cobalamin deficiency was present, and although the typical hyperpigmentation was attributable to cobalamin deficiency, the contribution of folate deficiency cannot be completely ignored.

Folate therapy should not be instituted in a patient with megaloblastic anaemia till cobalamin deficiency has been ruled out. The danger is that folic acid will improve the anaemia but not the neurological complications of cobalamin deficiency and the neurological disorder will worsen. Both cobalamin and folate should be initiated if cobalamin deficiency is also detected.

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This case study was awarded second prize in case presentation competition, conducted by GPA-Greater Bombay on December 19, 2015.

RESEARCH NEWS

Research Publications from the Medical Division

- Study of Dementia: One Year Prevalence and Associated Variables: Aditi Chaudhari, K Mazumdar, S Nair, A Gaikwad. *Bombay Hospital Journal* 2015; Vol 57, No. 2, 158- 167.
- Survey on Hearing aid use & Satisfaction in patients with Presbycusis: Nalini Bhat, S. S.Shewale, P Kasat, H. S.Tawade. *Indian J of Otolaryngology*, April 2015; Vol 21, (2), 124-128.
- Breast Cancer Awareness among Middle Class Urban Women - a Community-Based Study from Mumbai, India: Anita Gadgil, Nobhojit Roy, A Chakraborty, K Bantwal, I Haldar *et al.* *Asian Pac J Cancer Prev*, 2014; 16(15), 6249-6254.
- Prediction of ease of laryngoscopy and intubation-Role of ULBT, Modified Mallampati Classification and TMD in various combination: Anjana Wajekar, S Chellam, P V.Toal. *Journal of Family Medicine and Primary Care*, January 2015, Vol 4, 101-105.
- Change in Neck Circumference after shoulder Arthroscopy: An observational study: Shrividya Chellam, S Chiplonkar, K Pathak. *Indian Journal of Anaesthesia*, June 2015; Vol 59, 365 -368.
- Cutaneous fluid leakage after epidural catheter removal: Kajal.S.Dalal, Chellam S: *Indian Journal of Anaesthesia*, Jan - Mar 2015; Vol 31, 133-134.
- Anaesthesia information booklet: Is it better than a pre-operative visit? Kajal Dalal, Chellam S, P.V.Toal. *Indian Journal of Anaesthesia*, August 2015; Vol 59, 511-513.
- Lancet Commission report titled: Global Surgery 2030: Evidence and solutions for achieving health, welfare and economic development. John Meara, Lars Hagander, Andy Leather, Atul Gawande, N Roy, *et al.* *The Lancet*, April 2015.
- Role of Pelvic Sonography in first trimester bleeding: Deepti Kurmi, V R. Jadhav, A Misri, N Mishra, S Prabhu, G Savani. *Journal of Evolution of Medical and Dental Sciences* 2015; Vol. 4, Issue 49, June 18; Page: 8516-8525.

- Comparative Study of Laparoscopic and Total Abdominal Hysterectomies: Nigamananda Mishra, A. Thomas, Dr. A. Misri. *Academic Medical Journal of India* Vol 3,(2), Apr-Jun 2015.

Research Papers Presented By Our Doctors

- Depressive symptoms in Schizophrenia: Relation to Insight and Perceived Stigma: **Dr. Pooja Mehta.** *Annual National Conference of the Indian Psychiatric Society, (ANCIPS) 2015 at Hyderabad in Jan 2015.*
- Trends of Psychiatric follow up of patients with Attention Deficit Hyperactivity Disorder – A retrospective analysis: **Dr. Tejas Gholap.** *ANCIPS 2015 at Hyderabad in Jan 2015.*
- Cutaneous fluid leakage after epidural catheter removal-A case report: **Dr. Kajal Dalal.** *MASCON-2015 held at Mumbai in Oct 2015*
- Paradoxical Vocal Cord Movement-A case report: **Dr. Shrividya Chellam.** *MASCON-2015 held at Mumbai in Oct 2015.*
- Prostate cancer in India -PSA and gene: **Dr. Satish Mishra.** *25th annual meeting of the Indian Society for the study of reproduction and fertility and international conference on reproductive health held in Mumbai.*
- Hyperhomocysteinemia in deep vein thrombosis, a case controlled study: **Dr. Jayesh Kalbhande.** *Association of Physicians of India conference held at Delhi in Feb 2015.*

Corrigendum

PULSE, November 2012, Volume 14. - "Urological abnormalities in children with urinary tract infection" The corrected sequence of authors of the above article is Dr.Sangeeta Sawant, Dr. Alpa Amin and Dr. Minakshi Bhat. The error is regretted.

Editor, Pulse.



Radiation Protection in Radiodiagnosis Department in Hospitals

Dr. Avinash U. Sonawane, Head, Radiological Safety Division,
Atomic Energy Regulatory Board,

Introduction

With the ever-increasing use of ionizing radiation in the diagnosis and treatment of patients, more hospital personnel exposed to ionizing radiation. It is therefore necessary that safety precautions and principles of radiation protection are strictly adhered to by the hospital staff. In recent decades, the medical imaging by using X-rays has experienced a technological revolution. These includes 256 slice multi-detector coronary CT angiography equipment, eclipse collimators in helical CT scans, special CT machines for high heart rate cardiac examinations, Cone Beam CT in dental radiology etc. Presently, there are more than 35,000 X-ray units in the country which includes 3400 number of CT equipment and 1300 Cathlabs for performing interventional procedures. This article highlights brief general safety and regulatory aspects of medical X-rays facilities.

Main precautionary measures for ensuring safe X-ray examinations

1. No persons other than those specifically concerned with a particular X-ray examination shall stay in the X-ray / CT gantry room during radiological examinations. The room shall be kept closed during the radiation exposure.
2. A suitable warning light such as "red light" shall be provided at conspicuous place outside the X-ray room and kept "ON" when X-ray equipment is in use.
3. Operating personnel of X-ray equipment are subject to direct scatter radiation and therefore shall always use aprons or whole body protective barriers of not less than 0.25 mm lead equivalent.
4. The X-ray technologists shall always stand behind the lead protective barrier

provided for their protection during exposures.

5. Holding of children or infirm patient for X-ray examination shall be done only by an adult relative or escorts of the patient and not by a staff member. Such a person shall be provided with protective aprons and gloves. No pregnant women shall hold the patient during X-ray examination. Immobilization devices shall be used to prevent movement of children during exposure. *In no case shall the film or X-ray tube be held by hand.*
6. Notice in local language shall be displayed in the X-ray department at a conspicuous place asking every female patient to inform the X-ray technologist or radiologist of whether she is pregnant. Examination of women known to be pregnant shall be given special consideration, such as avoiding fetus dose by using protective devices.
7. Gonad shield shall be employed to shield the reproductive organs of the patient unless it would interfere with the information desired. Eye shield shall be provided to protect eyes of the patients undergoing such special examinations as carotid angiography. Thyroid shield shall be used where necessary.
8. All radiation workers shall use appropriately (below lead apron) the personnel monitoring device, i.e. TLD badges.
9. Storage of TLD badges and undeveloped X-rays films when not in use shall be done appropriately in areas protected from X-ray and other radiation sources in the installations. *Do not leave TLD badges or the apron with badge inside the X-ray room after the working hours.*
10. To ensure minimum dose to the patient,

Typical radiation doses in medical diagnostic x-ray examinations

Examination/procedure	X-ray examination (An adult's approximate effective radiation dose)	Computed Tomography (An adult's approximate effective radiation dose)
Chest	0.1 mSv	7 mSv
Head	--	2 mSv
Spine	1.5 mSv	6 mSv
Mammography	0.4 mSv	--
Bone Densitometry	0.001 mSv	--
Dental intra oral	0.005 mSv	--
Extremities	0.001 mSv	--
Coronary CT Angiography	--	12 mSv
Computed Tomography (CT) - Abdomen and Pelvis	--	10 mSv
Computed Tomography (CT) - Colonography	--	10 mSv
Intravenous Pyelogram (IVP)	3 mSv	--
Radiography (X-ray)-Lower GI Tract	8 mSv	--
Radiography (X-ray)-Upper GI Tract	6 mSv	--

As per AERB directives, annual effective dose limit is 20 mSv/year averaged over 5 years and in any calendar year maximum dose shall not exceed 30 mSv for occupational workers.

For general public annual effective dose limit is 1 mSv/year.

the field size of X-ray shall be restricted to the minimum that is consistent with the diagnostic requirement. Particular attention should be paid to restrict field size in paediatric radiology. Gonads, should not be unnecessarily exposed to primary beam.

ogy procedures, it shall be ensured that the ceiling suspended screen, couch hanging flaps, lead glasses, thyroid shield and lead aprons are used and principle of ALARA, (i.e. Time-Distance-shielding) is observed.

Regulatory requirements for ensuring safety in use of X-ray equipment

11. Medical practitioners such as radiologists, cardiologists, orthopaedician are in a unique position to reduce unnecessary radiation exposure to the patient by eliminating any X-ray examinations that are not clinically justified or that provide information obtainable by alternative means.
12. In case of CT equipment, it should be ensured that proper use of safety features, application of automatic exposure control (AEC) systems (i.e. preset options concerning the tube current modulation) and other clinical/exposure protocols are duly observed.
13. While carrying out interventional radiol-

Atomic Energy Regulatory Board (AERB) is the national regulatory body for the enforcement of safe use of ionising radiation in the country. It is a regulatory requirement that License/Registration is obtained by users of medical X-ray equipment for its safe operation as per the Atomic Energy (Radiation Protection) Rules, 2004. AERB has launched the web-based system, named eLORA (e-Licensing of Radiation Applications) for licensing/registration of radiation facilities in the country. Readers are requested to visit website of AERB (www.aerb.gov.in) for further details on this subject.

Some Health Impacting Technology Transfers from BARC

"Rapid, continuous and renewable method for production of the anti-cancer drug Camptothecin" to M/s Sun Fruits Limited, Pune on August 13th, 2015.

This technology has been developed by the Nuclear Agriculture & Biotechnology Division (NA&BTD). It is a Plant tissue culture method for the continuous and enhanced production of the anticancer quinoline alkaloid camptothecin using multiple shoot cultures of *Ophiorrhiza rugosa* var *decumbens*. The yield of camptothecin in the cultures is found to be 0.056 % dry weight during a period of 35 days and the parent plant contained 0.002 % dry weight.

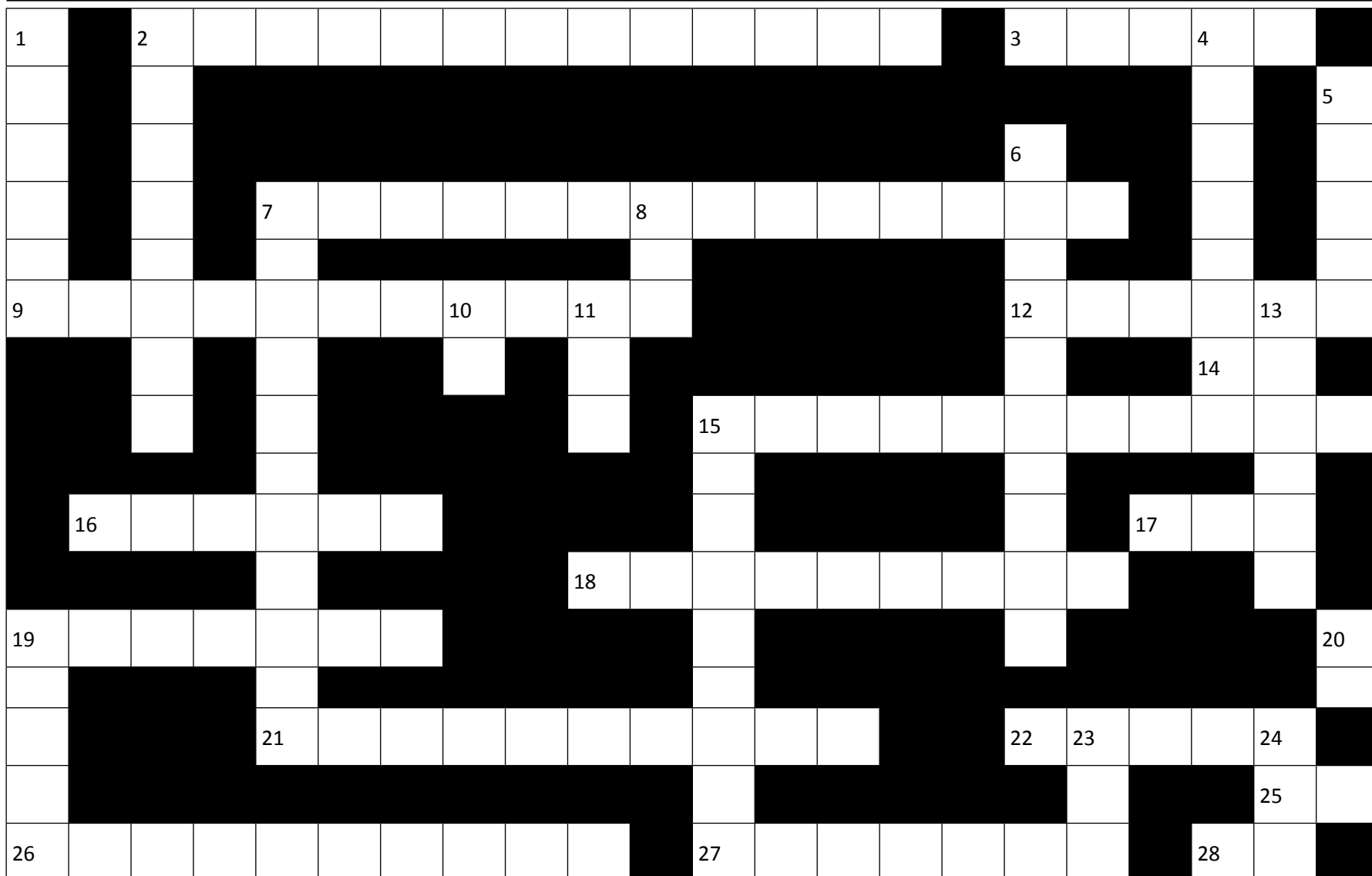
"Fluoride Detection Kit for Ground Water (FDK)" to M/s Transchem Agril and Private Limited, Vadodara, (Gujarat) on August 25th, 2015.

This technology was developed by the National Centre for Compositional Characterization of Materials (NCCM), Hyderabad. This field-kit has been devised for quick and easy estimation of fluoride in ground water for establishing its suitability for drinking purposes. The cost per analysis works out to be nominal. The procedure is as simple as adding a specified amount of FDK reagent to the water sample to be analyzed and identifying the color developed. The color develops instantaneously and the distinction can be made with the naked eye. Water sample can be immediately categorized as being safe, marginal or unsafe for drinking from fluoride point of view. Generally this kit can be an excellent tool for individual/community level identification of safe groundwater sources.



Mr. Jayesh Panchal won the 1st Prize for the above cartoon at the 31st DAE Safety and Occupational Health Professionals meet at Kalpakkam in Oct 2014.

CROSSWORD



Clues

Across

- 2) a delayed immune reaction(5,8)
- 3) inappropriately high water in your body(5)acronym
- 7) most trusted systematic research database(8,6)
- 9) popular blood thinner(11)
- 12) red swollen ear(6)
- 14) busiest unit of a hospital; also popular American television series (2)acronym
- 15) funny tingly sensation(11)
- 16) strongest muscle in the body; for

- some it's also the sharpest(6)
- 17) a scanning method; without this no MD /MS accreditation(3)acronym
- 18) nerve pain(9)
- 19) pigment for which you need SPF(7)
- 21) revolutionized the practice of medicine; bug fighter(10)
- 22) surgeons tool; holds vessels etc.(5)
- 25) urine output (2)acronym
- 26) 36-24-36; a necessity for research(10)
- 27) has 2 curves –lesser and greater(7)
- 28) you circle it when it is incompetent(2)

Down

- 1) pH of the stomach(6)
- 2) bunch of symptoms(8)
- 4) Killing you sweetly...(8)
- 5) wolf like; also an autoimmune disease (5)
- 6) dry mouth(10)
- 7) Bends you up with pain; transmitted by mosquitoes(11)
- 8) a type of lymphoma(3)acronym
- 10) needs to be removed on having troublesome stones(2)acronym
- 11) Examination Under Anesthesia(3) acronym
- 13) gives color to your eye; its

- inflammation (6)
- 19) slimy secretions(5)
- 20) in the muscle(2)acronym
- 23) thick hearted(3)acronym
- 24) was considered laudable(3)

Answers on pg. 12



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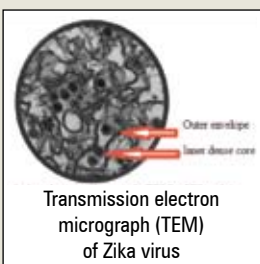


Zika Virus Bulletin

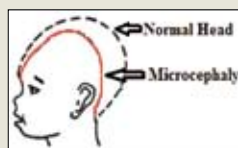
Compiled by Dr. Santoshi Prabhu, Editor- Pulse

- The virus, first isolated from the Zika Forest of Uganda in 1947, hence the name.

- Circulates in Africa, the Americas, Asia and the Pacific.
- Member of Flaviviridae family, transmitted by daytime-active Aedes mosquitoes which also cause dengue, chikungunya and yellow fever.
- The symptoms similar to other arbovirus infections such as dengue, and include fever, skin rashes, conjunctivitis, muscle and joint pain, malaise, and headache. Usually mild and last for 2-7 days.



- Possible association of microcephaly with Zika virus infection during pregnancy. Microcephaly usually results from abnormal brain development with long-term consequences ranging from mild developmental delays to severe motor and intellectual deficits, like cerebral palsy.

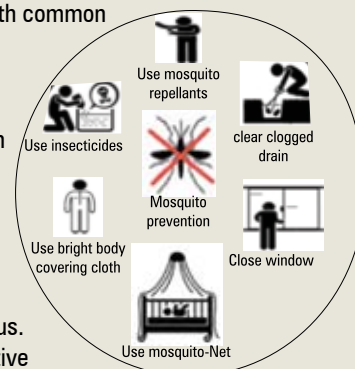


- Northeast Brazil reports increase in the number of infants born with microcephaly in Zika virus-affected areas. Zika virus RNA was identified in the amniotic fluid of two women whose fetuses had been found to have microcephaly on prenatal ultrasound and from multiple body tissues, including the brain, of an infant with microcephaly who died in the immediate neonatal period.
- Diagnosis by serology, Polymerase Chain Reaction (PCR) and virus isolation from blood samples, but can be difficult as the virus can cross-react with other flaviviruses such as



dengue, West Nile and yellow fever.

- Treatment - plenty of rest, drink enough fluids, and treat pain and fever with common medicines.
- There is currently no vaccine available. The best form of prevention is protection against mosquito bites.
- Scientists at Purdue University, USA have recently determined the structure of the virus. This may lead to effective treatment in the near future.



References:

- WHO media centre Fact sheets
- Possible Association between Zika Virus Infection and Microcephaly- Brazil, 2015. Centre for disease control and prevention Morbidity and Mortality Weekly Report (MMWR) / January 29, 2016 / 65(3); 59-62.

