PROCEEDINGS

OF THE

SECOND NATIONAL RESEARCH WORKSHOP

Application of New Biology to Medical Research In the Indian Context

9th & 10th March 2011

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

A DEEMED TO BE UNIVERSITY

TAMAKA, KOLAR-563101.

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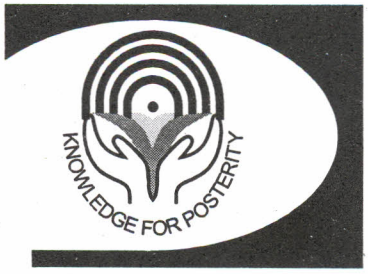

SDUAHER

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

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Sri Devaraj Urs Academy of Higher Education And Research
Second National Research Workshop

Sri Devaraj Urs Medical College is an ISO certified and NAAC accredited, 25 Years old Medical College situated in the semi rural environs of Kolar, Karnataka. In 2007 it was granted a Deemed to be University status by the Ministry of Human Resources Development, Government of India, under the name Sri Devaraj Urs Academy of Higher Education and Research.

The thrust areas of The Academy are imparting excellent Medical education, giving quality patient care and encouraging and engaging in research, especially in clinical and basic medical sciences as well as community/environment related topics.

The academy conducts several departmental research project and also collaboration with centers of excellence like CCMB Hyderabad; Indian Institute of Science, Bangalore; St. John's Medical College, Bangalore; Public Health Foundation of India, Hyderabad apart from international collaboration with University of Minnesota, USA.

The 2nd National Research Workshop of SDUAHER was held on 9th and 10th March 2011. The theme of the workshop was "Application of New Biology to Medical Research in the Indian Context". A total of 258 delegates (123 faculty, 95 PG students and 40 interns) attended the workshop. Several undergraduate students also availed the opportunity of attending many of the talks.

The workshop was inaugurated on 9th March 2011 by Dr. M.R. Satyanarayana Rao, Director, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore. He also delivered the Keynote address. Dr. S Chandrashaker Shetty, Vice Chancellor, SDUAHER and other eminent invited speakers graced the inaugural function. The thought provoking and motivating talks were spread over two days.

The workshop also included 14 scientific papers presented by senior PG students of various departments of Sri Devaraj Urs Medical College. These presentations were well appreciated by the visiting faculty. The Vice Chancellor give away prizes for the student papers.

1st : Dr. Kavita, *Dept of Pharmacology*

2nd : (a) Dr. Kavana, *Dept of Physiology*

(b) Dr. Parimala, *Dept of Microbiology*

3rd : Dr. Nikhil, *Dept of Surgery*

This brief 'Proceedings' of the workshop has been compiled to function as a reference of the talks by eminent faculty, as well as to record the scientific activity of the Academy.

KEYNOTE ADDRESS

Dr. M R Sathyanarayana Rao*

I think it is very appropriate that the title 'Application of New Biology in the Indian Context' has been chosen for this workshop. It gives me great pleasure in addressing the medical fraternity and discussing multidisciplinary approach to bio-medical research especially in the Indian context.

An understanding of Chemistry is essential for studying Biology. The development of Biology in the 50s and 60s involved and discoveries of metabolic pathways, enzymes, microorganisms and micronutrients. The period of 60s and 70s involved studies of molecules especially macromolecules like proteins and nucleic acids. The proposition of the DNA molecule by Watson and Crick stands out as one of the fundamental contributions to Biology after Charles Darwin's proposition of the Theory of Evolution. The Understanding of Recombinant DNA provided the opportunity for cloning and expression of proteins of biological interest. This further led to development of sophisticated biological technologies like PCR, DNA probes, antibody probes etc. Mapping of the human genome was the next major development in molecular biology.

In the Indian context, the challenge is to provide **affordable health care** by reducing the high cost of these newer technologies. For this, innovations are necessary. This may involve development of non invasive techniques as well as tests which do not require refrigeration. Work is in progress at the Indian Institute of Science, Bangalore for the development of a hand held PCR machine which does not require refrigeration. Technology and science should go hand in hand. It is very much required to create/generate new science to develop new technology which can be applied for the benefit of the community. When this application generates new science, it completes the **Cycle of Science and Technology** There is a need for a platform for interaction of the medical fraternity with basic scientists and entrepreneurs.

The medical fraternity should stimulate Bio Medical companies to innovate and produce low cost equipment / techniques. We should pose the problems for which the companies can find solutions.

Dr. M R Satyanarayana Rao is the President of Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) and Professor, Molecular Biology and Genetics Unit.
He is a visiting Professor at Baylor College of Medicine, USA, and Harvard Medical School USA.
He is a recipient of many awards including the Padma Shri.

We have to create an environment that provides opportunities for the human mind to absorb new knowledge. Healthy competition between research groups is good. Although institutional support is essential, our own effort is very important. Although the study of micro molecules is important, we must keep in mind that proteins do not function in isolation. Any outcome depends on their function as well as interactions. We must understand the cell at its ' cellular level' and not only at the molecular level Cells have their 'social network' and do not function individually. Phenotype depends on the genes as well as interaction. When the network is perturbed it results in disease (**Disease specific network**).

Most drugs developed today are single hit molecules. They are block buster drugs i.e. they will act on all cells. Ideally we should have patient specific drugs since the genotype of each individual is different. It is not profitable for industry to produce patient specific drugs. It therefore becomes advantageous for us to identify disease specific networks. A collaborative project between National Institute of Mental Health and Neurosciences (NIMHANS) and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) has been working on Glioblastoma Multiformae (GBM) / Astrocytoma. A network of neuroscientist, basic scientist, pathologist and biostatistician were involved. It was a unique experience. Fourteen different gene signatures for prognosis of GBM have been developed. This shows that different genetic routes can be taken to reach the same disease.

Medical colleges should use the expertise of basic scientists. The clinical and academic environment, along with support from policy makers can stimulate them to take up biomedical research. We should create a platform for brainstorming where scientific problems can be identified and addressed. Colleagues should be appreciative and supportive of each other (rather then pull each other down!). From an IT economy, we should become a knowledge economy.

In conclusion, from a knowledge absorbing society, we should become a knowledge producing society.

HOT WATER EPILEPSY BENCH TO BEDSIDE

Dr. P Satish Chandra*

Karnataka, a state in South India is known for its heritage sites, silk and also for some diseases like KSD(Kyasanur forest disease), Handigud syndrome and Hot water epilepsy (HWE). HWE is a type of reflex or sensory epilepsy (seizures precipitated by a sensory stimulus). In HWE the stimulus is pouring hot water over the head. HWE is also known as "Water Immersion Epilepsy" or "Bathing Epilepsy". Reflex epilepsies can also be triggered by solving mathematical problems, playing chess, listening to music (musicogenic), reading (linguistic) or multiple triggers might be involved.

Epidemiology

The first case of HWE was reported by Allen in 1945 from New Zealand in a 10 year old boy. Many such cases have been reported from various other countries as well. In India, the first paper on HWE was published in 1981 from South India and has been reported in Karnataka in 1985. There is an over abundance of reports of patients with HWE from South India, mostly from hospital based series. Community based series in Karnataka show clustering of HWE cases which is known as "Geographically Specific Epilepsy Syndrome". The incidence of HWE is around 60 per 100000 as per the Bangalore Urban-Rural Neuroepidemiological (BURN) study.

Clinical Features

Patients suffering from HWE after a hot water bath have a dazed look, sense of fear, irrelevant speech, visual and auditory hallucinations, giddiness, involuntary movements and about one third go in for generalized tonic clonic seizures.

The temperature of hot water ranges between 40-50 degree Celsius. HWE is more commonly reported in children and there is a male preponderance (2-2.5:1). Around 10% patients experience intense pleasure/ desire and continue to pour hot water over the head until they loose consciousness and are considered to suffer from "Self induced epilepsy". After a few years patients develop non-reflex epilepsy which is characterized by episodes of seizures without hot water bathing.

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*Dr. P Satish Chandra is the Director and Vice Chancellor of National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore. His main areas of interest include epilepsy and Neuro infections. He has been a Senior Visiting Fellow at "Raymond Way Research Group" at the Institute of Neurology, London.

Etiopathogenesis

The etiopathogenesis of HWE is a complex tactile and temperature dependant stimuli involving the temporal lobe, specifically the hypothalamic areas (thermoregulatory system). This has been investigated in animal models and called " Hyperthermic Kindling". During the process of kindling there is sprouting of neurons called Mossy fibers which can be demonstrated by special stains on histopathological examination.

In patients, when the temperature was recorded from pinna, there was an increase in temperature of 2.5 to 3 degree Celsius within a matter of 2 to 3 minutes during a hot bath. In normal people there is only mild increase of 0.5 degree Celsius.

The cause for HWE is functional as no lesions were detected on MRI and SPECT scan. A small percentage (11-27%) of patients with HWE have a history of febrile seizures and 7-15% of patients have a family history of HWE.

Various genetic studies have been carried out and HWE has been found to be passed on in families. Defects in chromosome 4, 8 and 10 have been noted. Studies postulate that an autosomal recessive mutation is a possibility and the high frequency of consanguinous marriage in many South Indian communities would explain the high prevalence of HWE in this population.

Management

The common practice by physicians is to advise luke warm water bathing or sponging with hot water towels for HWE patients. As HWE is a type of hyperthermic seizure, the new method of treatment involves intermittent prophylaxis with benzodiazepines (5-10 mg oral clobazam) 90 to 120 minutes before every head bath. This approach has a dual advantage of minimizing the cost of therapy and reducing the side effects associated with regular use of anti-epileptic drugs. Further work is in progress to identify the gene responsible for this interesting type of epilepsy with higher incidence among South Indian population and the role chanelopathies in the pathogenesis.

PREVENTIVE ASPECTS OF DEVELOPMENTAL DISABILITY

Dr Vrajesh P Udani*

Several neurological disorders like mental retardation (MR), severe brain injury, severe autism, chronic neuromuscular disorders like Duchenne Muscular Dystrophy (DMD), Spinal muscular atrophy (SMA) and neurometabolic disorder don't have specific treatment. But prevention of some of these neurological disorders goes long way in reducing morbidity and mortality. Eg. Vaccines against measles and polio markedly reduced incidence of SSPE and poliomyelitis; folic acid supplements to pregnant women for the prevention of neural tube defect. Usage of seat belt has reduced the incidence of head injury.

In India perinatal brain injury is a major cause for developmental disability. In industrialized nations, because of good perinatal care, the moratality and morbidity due to perinatal brain injury is very low. In developing countries though the mortality is reduced the morbidity remains high. Major contributors for perinatal brain injury include perinatal asphyxia leading to neonatal hypoxia- ischemic encephalopathy, sepsis, neonatal hypoglycemia and kernicterus.

Moderate to severe neonatal hypoxia ischemic encephalopathy leads to epilepsy, cerebral palsy and MR. Electronic fetal monitoring (EFM) in higher centers help in reducing incidence of ischemic encephalopathy. In India because of large number of home deliveries EFM is not practical. Moderate hypothermia by cooling the baby to 30-33^{0}c in first 6 hours of birth reduces the severity of brain damage. In few studies magnesium sulphate infusion and erythropoietin are used for treatment of perinatal asphyxia.

Periventricular leukomalacia is a brain pathology in preterms linked to sepsis and leading to spastic diplegia and epilepsy. Antenatal glucocorticoid treatment in pregnant mothers is known to reduce the severity of periventricular leukomalacia. Steroid reduces cytokine induced injury to white matter of brain.

In our centre, epilepsy patients below 3 years of age were prospecively using MRI. It was found that 23% of cases are due to neonatal hypoglycemia. Neonatal hypoglycemia is commonly associated with occipital lesions. Factors leading to neonatal hypoglycemia includes low birth weight, caesarean section, and poor & delayed establishment of feeding. These babies later develop autism, MR, visual impairment & epilepsy. In a study conducted at Kerala hypoglycemia is documented in 4% live birth infants. Many times hypoglycemia is diagnosed only after the

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episodes of neonatal seizures. In our own study of neonatal hypoglycemia delay in starting breast feeding in low birth weight babies and in caesarean section babies are the major contributing factors. The Indian Association of Pediatrics (IAP) recommends starting breast feeding in full term babies latest by 6 hours and in low birth babies latest by 2 hours of delivery. It is advisable to allow tempoary top feed in conditions where breast milk is not available / established. This might prevent hypoglycemia induced brain injury.

Occult ventriculitis is one of the important causes for infantile hydrocephalus. In our center 13 cases of occult ventriculitis were analyzed. In these patients, a course of antibiotic was given during perinatal period for sepsis but CSF routine and culture was not done. 10 out of 13 cases presented with history of increasing head size and 10 had CSF pleocytosis. 7 patients developed severe developmental problems. CSF culture, antibiotic policy and control of neonatal sepsis reduce the incidences of occult ventriculitis.

Haemorrahgic disease of newborn due to Vit K deficiency causes brain damage. As breast milk is poor source of Vit K, prophylactic injection of 1 mg of Vit K at birth prevents brain damage. Though there is no IAP recommendation, many pediatricians give Vit K at birth.

Infantile spasm with abnormal EEG also known as West Syndrome leads to Autism, MR, visual & developmental regression. Treatment with ACTH / prednisolone was found to be beneficial to these patients. In a study of 37 cases of cryptogenic spasm in Israel, treatment within one month showed 92% cases had spasm control and 100% had normal IQ, whereas delayed treatment resulted in 60% cases of MR. Early recognition and treatment improves the outcome of these patients.

Consanguinity still widely practiced in India, is an important etiological factor in epilepsy, cerebral palsy, and neural tube defect. Premarital counseling decreases consanguineous marriage.

Possible early and excessive TV watching and certain environmental factors maybe associated with increased incidence of autism.

Simple measures like early feeding, Vit K injection and prevention of perinatal asphyxia help in minimizing developmental disability.

INTERFACE BETWEEN CLINICAL PRACTICE AND BIOLOGICAL RESEARCH

Dr. Surendra K Yachha*

Man is a small particle in a vast galaxy. He further shrinks because of ego and greed. Science can be defined as the exploration of nature for the benefit of humanity. The objective of medical research should be to benefit society through prevention of diseases. improve therapy and decrease morbidity and mortality. Several advances have taken place in the last few decades in genetics, molecular medicine, therapy (drugs, biotherapy, stem cell therapy) etc. New disorders have been detected and variants of old ones identified. pathophysiology of several diseases have been found. Precision in diagnosis and specific therapy is possible now. We must work towards making all these cost effective to the patient.

Rare causes of diseases should be suspected and identified using modern tools. The incidence of **Idiopathic Neonatal Hepatitis (INH)** shrunk from 52% (in 1970-2000) to 15% (in 2001-2008). This was because of specific diagnosis of syndromic cholestasis like PFIC, Alagille and BASD as well as recognition of specific metabolic causes. **Celiac Disease** is not rare in India. It is common in the Gangetic belt of North India. It is found to be associated with HLA DQ2, which is the same as that in Western countries. **Indian Childhood Cirrhosis** was common earlier. It was attributed to the use of copper vessels leading to copper toxicity. After educating the population and preventing cooking in copper vessels. the disease has disappeared. This is a gratifying example of research which could reach and help many people.

Extra Hepatic Portal Vein Obstruction (EPHVO) can produce **Minimal Hepatic Encephalopathy (MHE)** in some children. Research has shown that this is due to hyperammonemia as well as release of cytokines (TNF-α and IL6). patients with EHPVO show the presence of anti-cardiolipin antibody and decreased functional protein C activity. Prothrombotic states have no role in the etiology of childhood EHPVO.

Viral Hepatitis is a common clinical problem. The incidence of Hepatitis A can be reduced by preventive measures. Hepatitis B can be prevented (even eradicated) by immunization. Hepatitis C is a serious chronic disease and can lead to liver cancer. The viral load can be detected by

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quantitative PCR. There are 6 major genotypes of HCV. The importance of genotypes is the variable response to therapy, and geographic distribution. Genotypes 3 and 2 seen in India show good response to therapy and therefore have a better prognosis. In cases of chronic hepatitis with raised immunoglobulin titres, all known causes must be ruled out before labeling as Autoimmune Hepatitis.

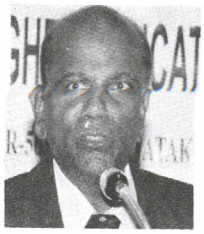
About 10% of cases of **Acute Pancreatitis** are thought to be drug induced. Several drugs have been implicated. Among children Valproic acid is the most common. Prednisolone and L-asparinase are also implicated. Many cases of idiopathic acute pancreatitis may actually be drug induced. At the same time, false labeling despite inadequate search for cause may lead to overdiagnosis of drug induced acute pancreatitis. The mechanism of action can be hypersensitivity, accumulation of toxic metabolites, hypertriglyceridemia or the intrinsic toxicity of the drug due to overdose. Good research in basic sciences is essential to establish the mechanism of toxicity.

Liver transplantation is a culmination of research in various fields-immune system and immunosuppressants, understanding regeneration mechanism of liver, technique of surgery. The first successful liver transplant of SGPGIMS was done in August 2003. Since it is difficult to get allographic grafts for transplantation, research is in progress to develop hepatocyte like phenotype from multipotent cells stimulated by growth factors. Stem cells from various sources bone marrow, umbilical cord blood, fetal liver and cirrhotic lives-are also being studied for hepatocyte regeneration potential Research is also progressing in various fields.

- Gene-Environment interaction in the causation of Inflammatory Bowel Disease.
- Techniques to study GI motility.
- Magnetic resonance spectroscopy.
- Pediatric liver transplantation.

Looking ahead, research should focus on environmental factors like food habits and lifestyle. Research should be in the direction of applied science and lead to betterment of mankind. Advanced technology has to be made available to do break through inventions. Researchers should concentrate on one field and do indepth work in those areas. Clinicians, basic scientists and the laboratory personnel should jointly address issues of importance. Scientists should eschew ego and encourage young, curious minds. Lethargy among researchers has to disappear in youth. This can be achieved by creating awareness among researchers.

HOST-AGENT INTERACTIONS IN NERVOUS SYSTEM INFECTIONS : CHALLENGES IN PATHOGENESIS AND DIAGNOSIS



Dr. Chandran Gnanamuthu*

My presentation will be more about telling some interesting stories than just about facts and figures or tables and charts. This is about the history of four decades and what research has meant to me. Though I am a clinician and not essentially a researcher it doesn't mean I haven't done research. Hence I will very briefly go over some of the things that have fascinated me over the last 35-40yrs.

Ever since I have been an undergraduate, there has been a curiosity in me as to why disease occurs. In the clinical years of my training, we were taught or asked as to what do you see (history and physical examination), why is it happening (pathogenesis), label the pathology (diagnosis) and diagnostic criteria (investigations). Through these four levels, either the disease fitted into the scheme of things or it didn't fit. When it didn't fit, we were taught to go back individually to all the four levels, recheck each step thoroughly so as to be able to pinpoint and come to a diagnosis.

So the diagnostic process had some diagnostic tests where a history and physical examination was done and a few technological tests were done. Then the diagnostic criteria was based upon major/key criteria and based on a few ancillary investigations.

Bimal Kumar Bachhawat was an eminent biochemist in the US. He was invited by Jacob Chandy, who was a neurosurgeon to start a Neurochemistry wing at CMC, Vellore. This was done and established in the same building in 1957 and it was the first ever Clinical Neurochemistry laboratory in the world. He did research on glycolipids, glycosaminoglycans, glycoproteins and their role in neural development. He also found out the absence of arylsulphatase A in Metachromatic Leuco Dystrophy (MLD) which kickstarted the entire discovery of lysosomal storage disorders.

As a student, I was still able to do some studies on cholinesterase under Dr. Bachnawat which was presented at a few society meetings. He was a genius because he would do world-class

Dr. Chandran Ganamuthu is the senior consultant Neurologist at Fortis Hospitals, Bangalore. Earlier as Professor of Neurology, he established and headed the Neurology Department of Christian Medical College, Vellore. He has a wide experience in health care delivery, medical education, clinical research and medical administration.

research on a shoe-string budget. He prepared chemicals in his own lab and sold them to laboratories in the US. Later he went onto the University of Delhi and then the Indian Institute of Chemical Biology, Calcutta. This was about the Biochemistry Neurology nexus.

One way of working with basic scientists is to identify a problem in their working area and interlink and do some study. So I worked with Mr Balasubramaniam who was Dr Bachhawat's successor and did the cholinesterase studies in collaboration with him.

I also worked with the Pathology department with Sushil Chandi and his student Geeta Chacko. In any patient who had expired, we would try to get permission to do a autopsy to find out the cause for death because those were the early days where there was no CT or MRI. So we had brain-cutting sessions every Saturday which would be attended by every single member of the department without fail. This was about the Pathology Neurology nexus.

One of the things we worked on was SSPE Subacute Sclerosing Pan Encephalitis. This was a post-measles state. It was seen around the ages of 5-15yrs with progressive myoclonus and dementia. And these patients progressed quite rapidly into a vegetative state. For this, I worked with a pediatrician Dr Jacob John who was is a Virologist, and his two students George Babu and Sridharan. With them, I was able to do quite a lot of studies as we would get patients with SSPE almost every week in Vellore. So the basic requirement is that, it requires a harmonious collaboration with the basic scientists to do novel work and to do really meaningful research or to answer a scientific question.

Another eminent person was Dr Carleton Gajdusek whom I have not met personally but who was at NIH in the US. He won the Nobel Prize for Medicine in 1976. He alongwith Vincent Zigas started working upon a new disease in New Guinea where people suddenly started behaving oddly, would have muscle wasting and die within 3-6 months. It was seen that the South Fore tribe of New Guinea amongst whom kuru was highly incident, indulged in mortuary feasts. They cooked and ate the bodies of tribe members who had died and smeared themselves with the brains as a sign of respect for the dead. When the mashed brains were injected into chimpanzees, they developed kuru 2 yrs later.

There was also another disease called Amyotrophic lateral sclerosis (ALS) in Guam. This Guamanian ALS was found in high rates in the Chomorro people of Guam. This was because they ate the meat of flying foxes (fruit bats) boiled in coconut milk and consumed the entire bat. These flying foxes in turn had fed on cycad nuts which was a palm tree indigenous to the island of Guam and they peculiarly consumed twice their body weight of nuts each night. So there was something in the nuts that was responsible for causing ALS in the people who ate the bats. This

Was studied by KV Mathai. I also had the opportunity to co-author a chapter with Dr. Mathai titled Motor Neuron Disease in India. This was in a book entitled Motor Neuron Disease in Asia and Oceania.

I also had the opportunity to meet and spend time with Stanley B Prusiner while in the US. He was working on slow virus diseases and since I too was interested in SSPE, I spent about a day with him. The major differences between SSPE and Prion diseases were that there was inflammation in SSPE but no inflammation in Prion disease; intranuclear and intracellular inclusions were seen in SSPE but not in Prion disease, the infective agent in SSPE was a virus whereas Prion disease was caused by the Prion protein and lastly, SSPE was caused by the Measles virus while there was no detectable DNA or RNA in Prion disease. It was only about 9 yrs later in 1997 that he won the Nobel prize for his landmark discovery.

Prion diseases are transmitted by a mere twisted protein something that lacks DNA and RNA and therefore not considered alive, is not killed by boiling or by ionozing radiation and is not recognised as foreign by the immune system. Stanley Prusiner identified them as tangles of normal proteins that had misfolded and clumped, "teaching" other proteins to follow; he named them as Prions. They are now recognised as the cause of Kuru, Scrapie, human Creutzfeldt-Jakob disease and Bovine Spongiform Encephalopathy (mad cow disease).

The advent of MRI into Medicine helped a lot in diagnosing and understanding new diseases as well as their pathogenesis. One of the diseases in which MRI has helped to play a significant role is demyelinating diseases, more specifically post-infectious demyelination. This was because it was possible to view the white matter lesions in the central nervous system. I had quite a number of cases of demyelination some of whom recovered completely but some of whom could not be saved. The important pathological features of these diseases was the presence of reactive astrocytes, GFAP immunoreactivity of the reactive astrocytes, foamy macrophages, perivascular infiltrates and ring hemorrhages.

Another important disease that I have worked on was HTLV-1 associated spastic paraplegia. As we all know, HIV was discovered in 1981. We did quite a lot of work on HTLV-1 associated myelopathy. We even published a couple of papers on this aspect, namely, Tropical Spastic Paraplegia as well as a few presentations in some conferences. We finally concluded that India mostly has HTLV-1-negative tropical spastic paraplegia.

Before I conclude, I would just like to emphasise on a few points. To create a scientist, we need to have some educational goals. This should be started in children at the school level itself. They

should be made to develop the ability of critical thinking, complex reasoning; they should be inherently creative and must pay attention to the esthetics of Indian culture and try to revive it; last but not the least, a scientist must be an effective communicator; he should have clarity in putting his thoughts forward. Sometimes it even helps that we come from different educational backgrounds like Mathematics, Physics or Chemistry backgrounds. This particular aspect, I feel, has to be recommended because it goes a long way in helping us understand and tackling complex phenomena that we may encounter in the world of science. We need to have excellent mentors who can guide us and help to start developing the thought process; we have to work as a team because science needs an inter-disciplinary approach. Most importantly, every team needs a team leader; not one who leads from the front but one who leads from the back and helping to push young people forward.

TRANSLATIONAL RESEARCH AS DEVELOPED AT L & T MICROBIOLOGY RESEARCH CENTRE, SANKARA NETHRALAYA, CHENNAI

Dr. H N Madhavan

The vision of the institute is to make it a centre of excellence in applied research in Ophthalmology and allied medical sciences, to enhance the quality of vision research programmes by increasing the space and equipments. The result of basic research conducted could be translated into applications directly affecting the management of infections of the eyes and other sites of the body.

PRINCIPLES OF POLYMERASE CHAIN REACTION

Scarcely any invention has altered biological science so radically in a very short period of time as the polymerase chain reaction, or PCR. With this technique, minute amounts of DNA can be replicated very rapidly *in vitro* and amplified in to a large amount of DNA to be detectable for its study and use the results for any investigation on it for a given purpose. In 1983, American chemist Kary Mullis was struck by an idea that was later to earn him the Nobel Prize: the principle of the polymerase chain reaction. PCR is a powerful technique which is a rapid, inexpensive and simple way of copying specific DNA fragments and wherever genes provide clues to the cause or natural history of a disease, PCR is the method of choice for its detection and assay.

The basic PCR principle is simple. As the name implies, it is a chain reaction: One DNA molecule is used to produce two copies, then four, then sixteen and so on in an exponentional increase resulting in increasing quantity (2^n). This continuous increase in copy numbers is accomplished by specific enzyme proteins known as DNA polymerases, that are able to string together individual DNA building blocks (nucleotide) to form long molecular strands. To perform their job, polymerases require a supply of the nucleotides which consist of the four bases adenine (A), thymine (T), cytosine (C) and guanine (G). They also need a small fragment of DNA, known as the primer, to which they attach these nucleotides as well as a longer DNA molecule to serve as a template for constructing the new strand. If these three ingredients are supplied, the enzymes will construct exact copies of the templates.

The DNA polymerase, known as '*Taq* polymerase', is named after the hot-spring bacterium *Thermus aquaticus* from which it was originally isolated. The enzyme can withstand the high

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temperatures of about 94°C needed for DNA-strand separation, and can be left in the reaction tube. The cycle of heating and cooling is repeated over and over; stimulating the primers to bind to the original sequences and to newly synthesized sequences with the enzyme catalyzing the process of annealing the primers and extending primer sequences. This cycling of temperatures results in copying and then re-copying of copies, and so on, leading to an exponential increase in the number of copies of specific sequences. Because the amount of DNA placed in the tube at the beginning is very small, almost all the DNA at the end of the reaction cycles is made of copied sequences.

These reaction products can be separated by gel electrophoresis. Depending on the quantity produced and the size of the amplified fragment, the reaction products can be visualized directly by staining with ethidium bromide or a silver-staining protocol, or by means of radioisotopes and autoradiography. The following steps are required for the process and this is referred to as "thermal profile" which varies as per the requirement of a specific PCR for the gene target identified.

PCR procedures

1 Denaturation

DNA fragments are heated at high temperatures around 92°C to 95°C, which results in the DNA double helix to separate in to single strands. These single strands become accessible to primers specially designed for the specific gene of interest.

2 Annealing

The reaction mixture is cooled down. Primers anneal to the complementary regions in the DNA template strands, and double strands are formed again between primers and complementary sequence. During annealing (about 1 - 5 mins at temperatures ranging between 45°C and 65°C), one primer binds to one of the DNA strand and another binds to the complementary strand. The annealing sites of the primers are chosen so that they will prime DNA synthesis in the region of interest during extension.

3 Extension

The DNA polymerase synthesizes a complementary strand. The enzyme reads the opposing strand sequence and extends the primers by adding nucleotides in the order in which they can pair. During extension (about 1 min at 72°C), the DNA synthesis proceeds through the target region and for variable distances into the flanking region giving rise to 'long fragments' of variable lengths. The whole process is repeated over and over. The PCR steps are all carried out, one after the other, in bouts of cycling. In the initial denaturation step, complete denaturation of the DNA template at the start of the PCR reaction is essential. Incomplete denaturation of DNA will result in the inefficient use of the template in the first amplification cycle and, consequently, poor yield

of PCR product. Figure 1 showing the steps involved in the PCR reaction is shown below.The annealing temperature may be estimated as 5°C lower than the melting temperature of the primer-template DNA duplex. If non- specific PCR products are obtained in addition to the expected product, the annealing temperature can be optimised by increasing it stepwise by 1-2°C. Usually, the extension step is performed at 72°C and a 1-min extension is sufficient to synthesise PCR fragments as long as 2 kb (kb = kilobase = 1000 bp). When larger DNA fragments are amplified, time is usually extended by 1 min per 1000 bp. The number of PCR cycles will basically depend on the expected yield of the PCR product. After the last cycle, samples are usually incubated at 72°C for 5 10 mins to fill in the protruding ends of newly synthesized PCR products.

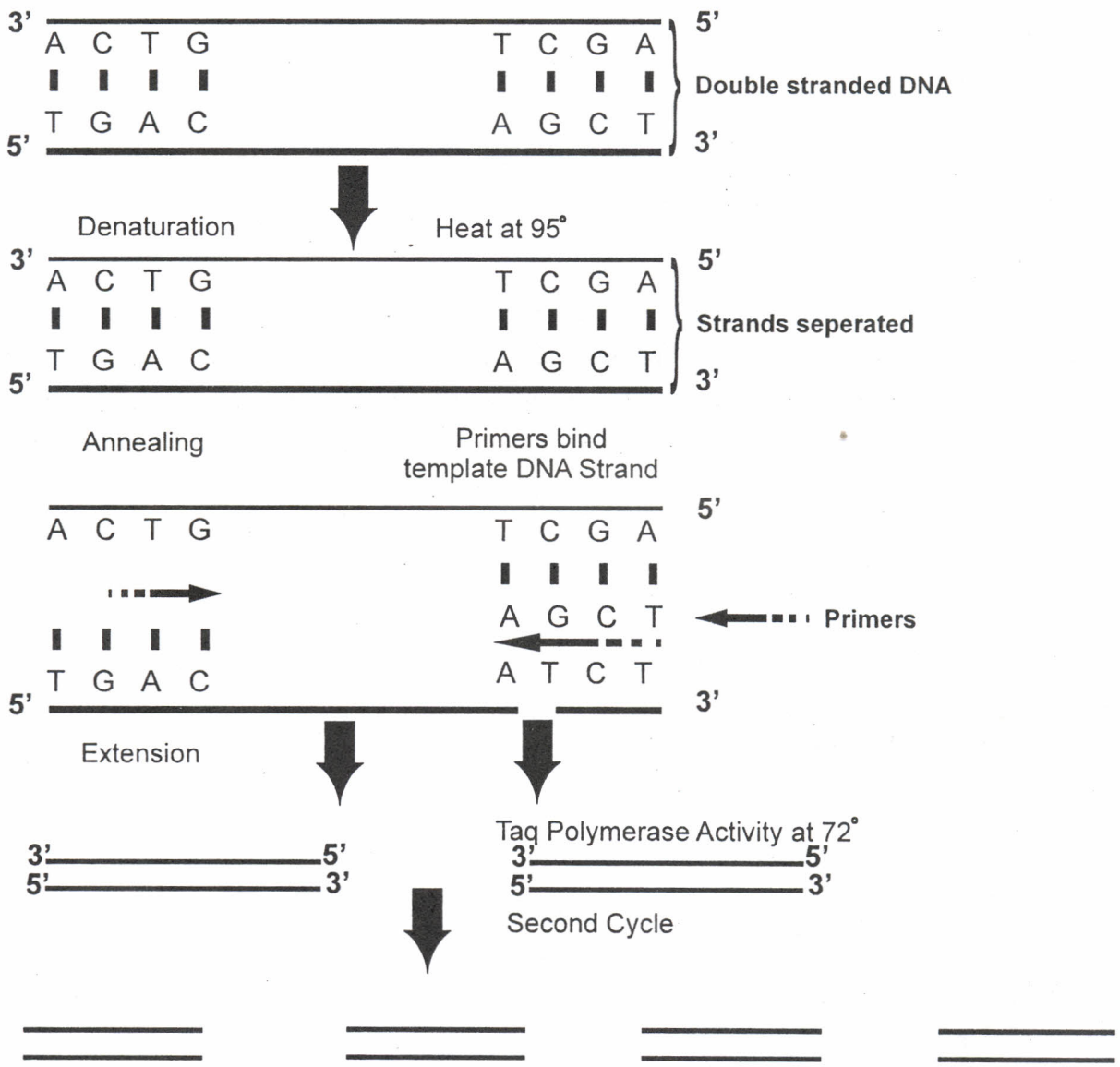

Figure 1 Schematic representation of the steps involved in PCR

Ocular infections

The spectrums of ocular infections are: external ocular like, conjunctivitis, keratitis and intra-ocular infections like endophthalmitis, retinitis, retinochoroiditis, optic neuritis, Eale's disease, congenital cataract and uveitis. The diagnosis of these infections may be by conventional methods like direct microscopy and culture. There are various limitations of these conventional methods like, inadequate sample, low number of infectious agents, inability of organisms to grow in-vitro, time factor and lastly, prior therapy. Hence a need for a rapid and sensitive nucleic acid based molecular methods especially because ophthalmic infections are sight threatening.

Applications of PCR in Ocular infections

The indications for PCR are, when several infectious agents are associated with clinical diseases, patients do not respond to appropriate therapy, and to confirm aetiology when surgical procedure is contemplated. These molecular methods are used because the clinical diagnosis of both external ocular and intra ocular infections are hampered by atypical clinical presentation. These methods are rapid, sensitive, specific and pathogen can be identified to genus and species level.

Nucleic acid based molecular assays are versatile tools based on genetic material of microorganisms, It detects genome of pathogens, quantities number of pathogens, can be applied on wide range of clinical specimens, aids in timely institution of specific therapy, provides idea on genetic basis of antibiotic resistance, gives an insight on pathogenesis of disease and helps in understanding epidemiology of infectious diseases.

Extraocular infections

PCR can be used to identify various organisms like *Adenovirus, Coxsackie A 24 virus*, *Chlamydia trachomatis* causing conjunctivitis and *Herpes simplex virus, Acanthamoeba*, pan fungal including non sporulating moulds which cause keratitis.

There are various serotypes of *Adenovirus* causing conjunctivitis. A multiplex PCR for Adenovirus genus typing was developed. Though there is no treatment required for these infections, identification is needed so that the patients could be isolated to prevent spread of infections. This method was used for identifying a novel Adenovirus type as a cause of epidemic in Chennai in the year 2010.

A study done on 109 conjunctival specimens in 2006 by PCR showed Enterovirus as a causative agent in 76 (62.9%), Adenovirus in 19 (17.4%), and no viral aetiology in 14 (12.9%). Among the Enterovirus 41(53.9%) belonged to Coxsackie A 24 variant by type specific PCR.

A hospital based study on prevalence of conjunctivitis due to Chlamydia trachomatis was conducted by application of PCR targeting major outer membrane protein (MOMP) region of C. Trachomatis.

Application of PCR to differentiate Herpes simplex virus 1&2 serotypes based on sequence variation found in glycoprotein G & I.

Acanthamoeba was diagnosed by semi-nested PCR by detecting 18Sr RNA gene.

Fungal keratitis is diagnosed using semi-nested PCR targeting internal transcribed spacer (ITS) region for detection of panfungal genome in corneal specimens. The non sporulating moulds are those fungi which fail to sporulate in vitro inspite of using a sporulating media. These account to 12% of fungal infections at L&T Microbiology Research Centre causing keratitis. PCR based DNA sequencing has identified 27 emerging pathogens.

Intraocular Infections

Molecular methods like multiplex PCR is developed to detect aetiological agents associated with infectious endophthalmitis like *Eubacterial, P. acnes* and *panfungal* genomes. 23 different bacteria were identified and reported for the first time in literature causing infectious endophthalmitis by PCR and denaturing high performance liquid chromatography (dHPLC) in culture negative intra ocular specimens. Multiplex PCR is developed for identification of *HSV, CMV, VZV* in causing viral retinitis. The genes identified were DNA polymerase gene for HSV, mtrll gene for CMV and ORF 63 gene for VZV. The quantification of CMV is important in immuncompromized individuals and hence a multiplex PCR combining PCR reactions for four different genes of human CMV for rapid quantification of viral copies/ml present in clinical samples.

Other viral infections like congenital Rubella syndrome were diagnosed by DNA sequence of 143bp amplified product of *Rubella virus*, which showed genotype 1 predominance in paediatric population with congenital cataract in India. Detection of B1 gene by nested PCR was used for detection of *Toxoplasma gondii.*

A semi nested PCR for rapid detection and specific identification of *Mycobacterium fortuitum* and *Mycobacterium chelonae* associated with Eale's disease was developed.

Macro DNA Vision Chip for Ocular Infections

World's first DNA chip for eye infections was designed and developed along with xcyton for diagnosis of four different ocular infections like viral retinitis, keratoconjunctivitis, infectious endophthalmitis and uveitis and clinically suspected Mycobacterial infections. The chip has 14 infectious agents and one human beta globin gene. The 14 agents are *HSV, CMV, VZV, Adenovirus, C.trachomatis, Eubacteria, Gram positive and Gram negative bacteria, P.acnes, Mycobacterium tuberculosis, My. fortuitum, My. Chelonae, panfungus, T. Gondii.* The chip is Macro DNA chip, where results are detected by naked eye. The advantage of DNA chip over PCR is, that is a single chip, can detect probable infectious aetiology ie. Multiplex format, reduced cost, time, labour reduced, risk of cross contamination and its sensitivity equivalent to nested PCR.

Thermo-reversible polymer in cultivation of corneal limbal stem cells

A healthy corneal epithelium is required to maintain the transparency of cornea condition both in normal and wound healing conditions and this is achieved by a population of stem cells (SC) located in the basal epithelium at the corneoscleral limbus. The efficacy of autologous expanded corneal epithelial cell transplants derived from harvested limbal biopsy cultured in a termo-reversible polymer (Mebiol Gel) for the management of unilateral Limbal Stem Cell Disease (LSCD) was evaluated. Corneal limbal biopsies from 12 rabbits were cultured embedded In Mebiol Gel at 37°C. Cells were harvested from the culture dishes after 3 weeks by reducing temperature to 4°C. Autologous transplantation was undertaken to reconstruct the experimentally induced limbal stem cell deficiency in the rabbit eyes. Outcome measures based on the scoring system of corneal vascularization, corneal haze, fluorescein staining and histopathology were evaluated, recorded and documented. The corneas of both eyes of all rabbits were harvested later for histological and RT-PCR studies. Reparative surgery was a total success in 7 (58.3%; score, 8-10), partial success in 2 (167%; score, 6-7) and failure in 3 (25%; score). Histological and RT-PCR study documented successful growth of corneal epithelium onto the recipient surface. Our results suggest that transplantation of autologous limbal epithelial cells grown in termo-reversible gel polymer may restore a nearly normal corneal epithelial surface in eyes with unilateral LSCD.

CONCLUSIONS:

- Cost of 'in house' PCR assays are considerably low.
- Method of amplicon detection influences cost.
- PCR does not involve dangerous procedures or highly toxic reagents.

- Skills required to perform PCR are similar to that required for a good microbiology *technician.*
- Volumes used in amplification assays are very little hence good eyesight, a steady hand and nimble fingers are essential.
- Quality control and trouble shooting skills take far longer to acquire.
- A rigorous quality control measure is essential to ensure accurate results.
- Formal training of technical staff is essential.

PREDICTIVE ONCOLOGY

Dr. Anita Borges

Surgical pathology is involved in direct clinical decision making and surgeons depend on pathologists to know prediction and effectiveness of treatment response in many cancers. They need all information regarding what to do once a cancer has been diagnosed. Surgical pathology reports should be clear, comprehensive, succinct, as accurate as possible and relevant to patient management.

Understanding a few terminologies before going into detail of predictive oncology is essential. *Augury,* means reading omens on a specific occasion, is done by surgical pathologists. *Prognosis* is inherent biological behavior and host responses to a disease.

Prediction is quantitative and qualitative measurement of therapeutic response to a disease. Now we are in an era of personalized medicine, where we aim to give *'Right drug in right dose to the right person'*, which is the final goal of cancer therapy.

Breast Carcinoma

Breast carcinoma is considered as an epitome of predictive pathology. Some women responded excellently post- oophorectomy. This helped in identifying the estrogen and progesterone receptors which play a vital role in the prognosis of breast carcinoma. Initially crude methods were used to identify and quantify these receptors. But the invention of immunohistochemistry to localize estrogen receptors was a landmark in treatment of breast carcinoma..Estrogen receptors are located on the nucleus of a cell , which is stained when immunohistochemistry is done αEstrogen receptor positive tumours deficient in cyt P450 cypD2D6 respond better to aromatase inhibitors than tamoxifen.

Many women did not respond well with hormonal therapy. That led to the identification of HER (Human Epithelial Receptor).The HER family of receptors are present on the cell surface and contain an extracellular domain, transmembrane and a tyrosine kinase domain. Each of these domains is responsible for a different aspect of HER signaling pathways. There are 2 HER receptors- HER-1 and HER-2. Binding of HER-1 receptors to specific ligands like Epidermal growth factor(EGF) and Transforming Growth Factor α (TNFα) leads to receptor dimerisation and transphosphorylation. This stimulates downstream signaling of tyrosine kinase pathway ,

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leading to cellular effects like increased proliferation, tumor angiogenesis and metastasis. Hence, tyrosine kinase inhibitors , popularly known as "nibs" has beeen used as targeted therapy in the treatment of cancer. The HER-2 receptor dysregulation is due to gene amplification and receptor overexpression. Successful targeted therapy in the form of monoclonal antibodies , popularly called as "mabs" has been developed ,which prevents HER-2 receptor activation by binding to the extracellular domain of the receptor. Immunohistochemistry is thus used to identify HER receptors which is present on the membrane of cells.

About 20% of tumours are triple negative (negative for ER,PR,HER). Then look for basal type of cancers which contribute to 73% of the cases. It is important to identify these basal type tumours because they are extremely sensitive to platinum salts. Hence a stepwise approach for predicting the prognosis of breast carcinoma is required.

DNA may or may not be expressed in a tumour. Presence of cDNA indicates that DNA is being expressed. Oncotype Dx, Roche Amplichip 450 is available to identify this gene expression.

Squamous carcinoma of the head and neck

More than 95% of squamous cancers of the head and neck show EGFR (Epithelial Growth Factor Receptor) amplification. Cetuximab is a monoclonal antibody against the ligand binding end of EGFR. For drugs to work on this receptor, signaling molecule should be of wild type that is not mutated. Cetuximab is being used along with radiation therapy in advanced head and neck cancers. The next question is whether Cetuximab can replace platinum in Chemorad protocols.

Other cancers

In chronic myeloid leukemia (CML) with bcr-abl gene expression, there will be increased tyrosine kinase activity. Treating CML cases positive for bcr-abl gene with Imatinib which is a tyrosine kinase inhibitor increases the survival of CML patients.

C-KIT (CD117) is a marker which is present in gastrointestinal stromal tumors (GIST). Here also Imatinib which is a tyrosine kinase inhibitor is used as a targeted therapy. Imatinib works well only for exon 11 mutations and not so well for exon 9 or wild type mutations

Clear cell carcinoma contributes to two thirds of all renal cell carcinoma. Loss of genetic material or gene silencing on 3p in the region of VHL gene will occur. The VHL gene is involved in regulating angiogenesis through HIF, the downstream targets of which are VEGF, GLUT1 & carbonic anhydrase 9 .Bevacuzimab (Avastin) is an anti VEGF antibody, usually works well in clear cell renal cell carcinoma.

In our research work titled 'Angiogenesis is redundant for tumour growth in lymph nodes' published in journal 'Histopathology' in 2001 , it was shown that lymph node metastasis from unknown primary does not need angiogenesis for growth or rather it has angiogenic incompetence. The implications of this study was that if angiogenesis is redundant for growth in lymph nodes, it is likely that anti-angiogenic therapy viz. bevacuzimab, will not work in the situations like unknown primary metastasis to lymph nodes in particular and lymph node metastasis of squamous carcinoma in general.

Now we are in an era of personalized medicine, where we aim to give *'Right drug in right dose to the right person'*, which is the final goal of cancer therapy. Individual variation in drug response and/or toxicity, gene polymorphisms, genes involved in drug metabolism/ drug response, enzymes, ion channels and drug receptors has to be considered. But this may complicate the severity of existing problem.

To summarise , molecular diagnosis has made an impact on the current management of several previously difficult to treat tumours Tumour biology helps us understand why we succeed and why we fail.. Lasting control has been achieved in Breast cancer, CML, GIST, and Large B cell lymphomas. Good palliation has been achieved in brain, lung, kidney, head and neck cancers but is expensive.

- We need to look beyond traditional methods in diagnosing a disease.
- Keep up with advances in therapeutics
- Keep abreast with techniques that identify targets
- Collaborate in targeted therapy research & pharmacogenetics

"We may yet classify tumors by their deranged molecular pathways and response to targeted therapy rather than cell of origin, as we do today"

NEW BIOLOGY – TRANSLATIONAL MEDICINE, AND BEYOND

Dr. P.R.Krishnaswamy*

The pursuit of pure science, especially if one is engaged in the understanding of life processes and phenomena thereon, does not have barriers of what we once recognised as disciplines of chemistry, physics, biology or mathematics. My own long career is somewhat of an example. Qualified as a chemist, excitedly interested in microbial metabolism, later in enzymology with depth of engagement in mechanisms, gradually acquiring an interest and a working career in human health and disease, as demanded by the specialities in laboratory medicine, I belong to a fortunate generation of biochemists who could witness, experience and contribute to the clinical sciences drawing from basic science knowledge and resources of chemistry, biology (molecular as well as "classical") and microbiology. What we have now begun to address as "Translational Medicine"- bench to bed and bed to bench – activities which have gone on for almost two centuries at snail's pace initially, to galloping in the last century and to jet speed currently is an old art with a new label and much hype to attract support and attention for gain.

Carl Woese is one of world's greatest experts in the field of microbial taxonomy, in classification and understanding of the evolutionary significance of his work. His provocative work which has led to the construction of a new tree of life with three branches, of bacteria, archea and eukaryotes, points to the need, as argued by him to recognise the obsolescence of reductionist biology as it has been practiced for the last hundred years, which assumes that biological processes can be understood by mainly studying genes and molecules. Medicine being applied biology like agriculture, has certainly benefitted from the advances in "New Biology." New Biology essentially centres around the central dogma of DNA-> RNA -> protein, the language of genetic information, the technologies that flow from it, the engineering of many observations to practical applications in therapeutics, diagnostics, imaging modalities, interventional protocols, etc. molecular genetics, somatic cell genetics, mobile cell systems, membranes, hormones and deeper understanding of regulatory mechanisms. Life support systems, new classes of drugs, successful cancer chemotherapy, interventional procedures guided by imaging advances, organ transplantation are major achievements which owe their origin and gainful application to the New Biology. Prenatal diagnosis of hereditary disorders by amniocentesis are possible because of our ability to understand gene defects and gene products. It is in the light of all these advances, and the further efforts, ongoing, intense and expansive to understand, and possibly achieve reverse engineering functions of the brain, that we must pause and contemplate on the need to take a fresh

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look at biology, -- human biology that is medicine, from an evolutionary perspective; Not limited by the purely almost compulsive reductionist approach of the current molecular biological, chemical perspective. What may be needed is the emergence of a systems biology based on dynamic and constantly changing patterns of organisation. The picture of living beings, including the human race, as patterns of organisation rather than collections of molecules would be clearer in the twenty first century. The reductionist physics and molecular biology will continue to be important, but they may not be as dominant as they are currently. The bigger problems - origin of life, consciousness, functions of the brain – all require for understanding, new ways of thinking and new ways of organising and deriving from large data bases and not by reducing them to molecules or elementary particles. Emerging is a realisation that to understand living systems in depth, we must perceive them not as machines or static materials, but as stable, complex and dynamic organisation with resilient patterns in a turbulent flow; in fact, "patterns in an energy flow". A trend in thinking about biological phenomena along these lines is sure to be part of the emerging New Biology with consequent effects on medicine, its translation bidirectionally to and from biological phenomena governing the human species in health and disease. Such translation will require a different script and grammer than the current currency.

UTILITY OF TOLUIDINE BLUE STAINING AND BRUSH BIOPSY IN PRECANCEROUS AND CANCEROUS ORAL LESIONS

Dr. Sapna M
Department of Pathology

Objectives of study

To evaluate the usefulness of toluidine blue and brush biopsy in the precancerous and cancerous oral lesions.

Study Design

This is a prospective study of 172 patients with premalignant and malignant oral lesions who attended the outpatient clinics of Otorhinolaryngology and Dental Surgery at R. L. Jalappa Hospital and Research Centre, Kolar, were screened with in vivo toluidine blue staining oral brush biopsy and wedge biopsy. Statistical analysis was done using statistical software SPSS version J 6. To test the diagnostic accuracy of the screening tests sensitivity, specificity and predictive value were calculated.

Results

Out of 172 cases predominantly 127 cases were females and 45 were males. 84.3% had a habit of areca nut & tobacco chewing. Maximum number of cases were seen in buccal mucosa and tongue (75%). Toulidine Blue staining of oral lesions showed strong positivity in 72% of cases. Brush Biospy detected 69% cases as malignant. Combined evaluation of toulidine blue and Brush Biopsy showed sensitivity of 88% and 93% for premalignant lesions and malignant lesions respectively. The false negative cases were reduced by this combined technique..

Conclusion

This study suggests that early detection of oral cancer is possible even at precancerous stage by using noninvasive, painless outpatient procedure of combined invivo supravital staining of Toluidine blue and Brush biopsy. Combined evaluation of toluidine blue and brush biopsy has helped to increase the sensitivity and specificity in detecting premalignant lesions and also to minimize false negatives.

EFFECT OF ROAD TRAFFIC NOISE EXPOSURE ON BRAINSTEM AUDITORY EVOKED POTENTIALS IN TRAFFIC POLICEMEN.

Dr. Kavana G Venkatappa
Department of Physiology

Background and objectives

Noise pollution in mega cities is considered to be one of the most important and pressing problems. A major contribution to the noise is vehicular noise. Traffic policemen bear the brunt of prolonged and high intensity exposure to this environmental pollutant. Both the intensity of noise and the length of exposure determine its ability to damage hearing and continued exposure to greater than 85dB of noise may cause gradual but permanent damage to hearing.

Brainstem auditory evoked potentials (BAEP) have been used as a d'iagnostic technique in audiology in investigating hearing loss in addition to audiometer. Brainstem auditory evoked response potentials are the potentials recorded from ear and vertex in response to brief auditory stimulation to assess conduction through auditory pathways up to midbrain. Studies carried out for evaluating the effects of noise on human BAEP are minimal. With this background, the present study of effect of noise on BAEP in traffic policemen vis- a vis of the levels and duration of exposure to vehicle noise is carried out and compared it with age matched control population.

Materials & Methods

Thirty traffic policemen manning traffic and 30 age matched controls who were involved in administrative work were selected considering inclusion & exclusion criteria. These two groups were asked to fill questionnaire to assess the auditory effects of noise, then they were subjected to pure tone audiometric assessment and BAEP recordings. The resulting data was statistically analysed.

Results

Noise levels recorded were significantly high in study group (traffic policemen) than controls. Three of traffic policemen felt that their hearing ability was below average by self assessed questionnaire. There was increase in hearing thresholds at frequencies of 4kHz (AC and BC), 6kHz (AC) and 8kHz (AC) in traffic policemen compared to that in controls. Wave latencies were significantly prolonged in traffic policemen than controls. Within the study group, the wave latencies were prolonged in traffic policemen with hearing loss than traffic policemen without hearing loss. There was a positive correlation between exposure index (noise level in dBA x duration of exposure to noise in years). Wave latencies (wave I, II and III) were significantly prolonged in traffic policemen without Noise induced hearing loss (NIHL) as compared to controls.

Conclusion

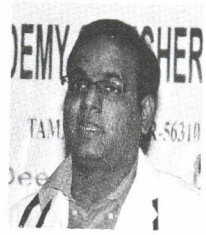
There is increase in hearing thresholds and wave latencies of BAEP in traffic policemen who were exposed to continuous and loud noise. The wave latencies (wave I, II and III) were significantly prolonged in traffic policemen without NIHL as compared to controls suggesting that these changes precede the audiometric findings and hence BAEP might serve as a useful tool in detecting early signs and hence necessary precautions can be taken to prevent deleterious effects of noise.

With this background, some preventive modalities for bearing conservation in the form of safety equipment (ear plugs, ear muffs etc), periodic checkups (audiometer, BAEP ete) and duty scheduling for exposure limitation can be suggested and awareness; should be created among traffic policemen about the harmful effects of noise on hearing by implementing education and training program.nes.

VENTILATOR ASSOCIATED PNEUMONIA: STUDY OF CLINICAL PRESENTATIONS, ORGANISMS INVOLVED AND OUTCOME

Dr. Chandan Bansal

Department of Medicine



Introduction

During the past 30 years our ability to care for critically ill patients has improved greatly, in part due to the expanded use of invasive techniques such as tracheal intubation and mechanical ventilation. Unfortunately. the widespread application of these techniques has resulted in increasing new nosocomial infection hazards, such as ventilator associated pneumonia (VAP).

Objective

To study the occurrence, risk factors and outcome of ventilator associated pneumonia in Intensive Care Unit of R. L. Jalappa hospital and Research Center, Tamaka, Kolar attached to Sri Devaraj Urs Medical College.

Material and Methods

The study of ventilator associated pneumonia is a prospective 110n controlled observational study. A total of 50 patients of VAP were evaluated during the study period and different parameters analyzed.

Results

It was found that crude mortality rate was 38%. Most of the patients were in age group of 30 - 50 years with male dominance. Right lower zone was most commonly involved and had statistically significant mortality rate. *Pseudomonas aeruginosa* was the commonest organism cultured in the Endo Tracheal Aspirate and mortality associated with it was higher although not statistically significant. Most effective antibiotic overall was Imipenam in the study group. The data obtained in the given study were comparable to the contemporary studies done.

ELECTROMYOGRAPHIC ASSESSMENT OF SPINAL ACCESSORY NERVE FOLLOWING NERVE SPARING NECK DISSECTIONS

Dr. Oommen Modayil G

Department of Otorhinolaryngology

Background and objectives

Head and Neck cancers are very common in India. The gold standard for treatment of neck metastasis in head and neck cancers has been neck dissection. One of the drawbacks of radical neck dissection is post operative shoulder dysfunction which is due to removal of spinal accessory nerve. To keep postoperative shoulder morbidity to a minimum, nerve sparing neck dissections are preferred. However inspite of saving accessory nerve in neck dissections, few patients develop shoulder dysfunction. This has been attributed to nerve stretching and devascularisation during surgery. Our objective was to evaluate preoperative and postoperative changes in electromyogram related to accessory nerve with reference to nerve sparing neck dissections-MRND, FND and SOHND.

Materials and Methods

A prospective study was done on 50 patients (51 shoulders) with histopathologically proven head and neck cancers with No or N] neck. Patients were assessed preoperatively and postoperatively at 3 weeks and 3 months by needle electromyography and muscle strength tests of upper trapezius. All patients underwent nerve sparing neck dissections-MRND or FND or SOHND.

Results and interpretation

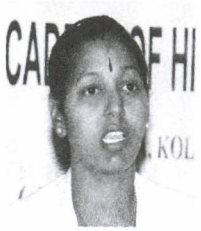
At 3 weeks postoperatively. 11 shoulders (39.3%) in FND group ,md 4 shoulders (33.3%) 111 MRND group showed severely abnormal EMG, while in SOHND group only 2 shoulders (18.2%) shoulders showed severely abnormal EMG. All patients who underwent nerve sparing neck dissections showed improvement in at least one category on the second electromyogram at 3 months. This could be attributed to neuropraxia or transient devascularisation of the accessory nerve. In our study, 22 patients after nerve sparing neck dissections (15 FND, 5MRND, 2 SOHND) did not show any improvement in their muscle strength in late postoperative period while their EMG showed improvement. This could be due to adhesive capsulitis. In our study, 11 patients in FND group showed severely abnormal EMG finding, but they did not have as great a degree of shoulder dysfunction as would be expected. This could be due to factors like preoperative condition of other synergistic shoulder girdle muscles, post operative exercises etc.

Conclusion

SAN injuries are common in all types of nerve sparing neck dissections, the incidence of which is less in SOHND. This injury is due to nerve stretching resulting in neuropraxia which tend to improve with time. To conclude, in patients in whom it is oncologically sound, nerve sparing neck dissections offers significant benefit in terms of shoulder function.

STUDY OF OXIDATIVE STRESS PARAMETERS, GLYCATED HAEMOGLOBIN AND LIPID PROFILE IN DIABETIC RETINOPATHY

Dr. Prabhavathi K
Department of Biochemistry



Abstract Background

Diabetes mellitus is known to induce oxidative stress along with deranging various metabolisms; one of the late complications of diabetes mellitus is diabetic retinopathy which is a leading cause of acquired blindness. Poor glycemic control, dyslipidemia and oxidative stress has been attributed to the development of complications like diabetic retinopathy.

Objectives

To study oxidative stress parameters (GSH & Vitamin C), HbA 1c and lipid profile in diabetic retinopathy patients and comparing the parameters and correlating the same with the controls.

Materials and Methods

The study included 25 diabetic patients with retinopathy, 25 diabetic patients without retinopathy and 25 healthy controls. between 30 - 70 years of age of either sex. attending at R. L. Jalappa Hospital and Research Center, Kolar. Fasting blood glucose. HbA_{1c} and Lipid profile were measured by using standard methods adopted in the clinical laboratory. Glutathione in erythrocytes was assayed by colorimetric method using DTKB as a chromogen. Vitamin C was measured by colorimetric method using

Results

The results obtained were analyzed statistically by independent student 't' test & ANOVA.
In our study. there was a significant increase in the FBS levels and HbA1c levels in diabetic patients with retinopathy and in diabetic patients without retinopathy when compared to the control group. There was a statistically significant decrease in the mean Glutathione in erythrocytes and mean Vitamin C levels in the diabetic patients with retinopathy and in diabetic patients without retinopathy compared to the control We found that there was statistically negative significant correlation between GSH with Total cholesterol & LDL cholesterol levels in diabetic mellitus group and there \:vas statistically significant correlation between Vitamin C with FBS levels in control groups.

EVALUATION OF EFFICACY AND SAFETY OF SOLIFENACIN COMPARED TO TOLTERODINE IN OVERACTIVE BLADDER SYNDROME

Dr. Kavitha

Department of Pharmacology

Background /Objectives

To compare the efficacy and safety profile of Solifenacin with Tolterodine in Overactive Bladder Syndrome.

Materials and Methods

Relevant data were collected from patient:- with GAB Syndrome, presenting to Department of Urology at R.LJalappa Hospital and Research Centre from December 2008 to May 2010. A total of 60 patients were enrolled in the study and written informed consent was taken from all the patients. Patients were randomized into 2 groups of 30 each to receive either oral Tolterodine 4mg or Solifenacin 5mg OD. Both the drugs were administered for a period of 8 weeks and the patients were followed up at 2, 4 and 8 weeks and assessed for efficacy and safety of the drug. Assessment of symptom and quality of life was done using OAB-SCS and PGI-I scale respectively at baseline and each follow up visits. Ultrasonography was done to assess the post voiding residual volume of urine. Laboratory Investigations included RBS, urine analysis, ultrasound examination of bladder and prostate. X-ray KUB and urodynamic evaluation as and when required.

Results

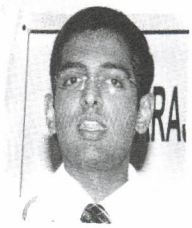
A comparison of PVRV showed a significant reduction in residual volume with Solifenacin which was similar to Tolterodine. When OAB-SCS and PGl-I scores were compared, both the treatments showed significant reduction in OAB symptoms and improvement in quality of life within the groups at every follow up visit.

Solifenacin produced a greater reduction in OAB-SCS and PGI-I scores compared to Tolterodine at all follow up visits but the reduction was statistically significant only at 2 weeks. Anticholinergic side effects were infrequent and mild in nature.

Conclusion

Solifenacin 5 mg once daily improved urgency and other symptoms of OAB and was associated with an acceptable level of Anticholinergic side-effects in treating symptomatic overactive bladder.

STUDY OF PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY



Dr. Nikhil
Department of General Surgery

Objective

To assess the safety and efficacy of laparoscopic cholecystectomy in terms of duration of operation, hospital stay, post operative analgesia, post operative recovery, complication of each procedure and patient satisfaction.

Background Data

Benign diseases of the biliary tract are one of the most common surgical problems in the world. Surgery plays an important part in the treatment and over half a million cholecystectomies are performed worldwide. Since its introduction in France, laparoscopic cholecystectomy has become the treatment of choice for symptomatic cholelithiasis. The postulated advantages of laparoscopic cholecystectomy are the avoidance of large incision. shortened hospital stay and earlier return to work. Our purpose in this study was to assess the safety and efficacy of laparoscopic cholecystectomy.

Materials & Methods

A prospective study, considering 20 patients treated with laparoscopic cholecystectomy in R.L.Jalappa hospital and research center attached to Sri Devaraj Urs medical college. Tamaka, Kolar, during the period of November 2008 to May 20 10. All patients with acute cholecystitis, chronic cholecystitis, cholecystolithiasis, empyema of gallbladder, mucocele of gallbladder, non perforated gangrenous gallbladder included in the study. Any patient with choledocholithiasis "Perforated gallbladder were excluded. Cases that encounter difficulty during laparoscopic cholecystectomy and converted to open cholecystectomy are included in laparoscopic Cases were reviewed after 7th day and 21st day of operation. Follow up ranges from minimum 3 months to maximum up to 6 months wherever possible. Laparoscopic cholecystectomies were described with respect to duration of surgery. Complications, resumption of oral intake, hospital stay, return to normal work and patient satisfaction.

Results

In our series of20 patients there was a female preponderance and the peak age group affected was 3rd, 4th and 5th decade. The most common indication for cholecystectomy was cholelithiasis followed by acute cholecystitis. Dense adhesions was the most common cause of conversion to open cholecystectomy. The patients had less post operative pain, started oral intake earlier and were discharged early. They were also able to resume their normal work sooner.

Conclusion

Laparoscopic cholecystectomy is a safe and justified replacement for open cholecystectomy. It should be an available option for all patients requiring electivc cholecystectomy. With the increasing acceptance amongst the operating surgeons and the patients , very soon it will be accepted as the treatment of choice for gallstone disease

EVALUATION OF MULTIPLE LABORATORY METHODS FOR THE DIAGNOSIS OF EXTRAPULMONARY TUBERCULOSIS

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Introduction

Tuberculosis remains a worldwide public health problem even after J 00 years of the discovery of the causative agent, Mycobacterium tuberculosis. The emergence of HIV infections has further complicated the disease burden as it has rapidly increased the risk of pulmonary and extra pulmonary tuberculosis. Extra pulmonary tuberculosis IS an important clinical entity. The term has been used to describe isolated occurrences of tuberculosis at body sites other than lungs. The precise diagnosis is very important because early detection of cases and effective treatment if instituted at the right time, completely cures the patients of the disease.

Objectives

1. To find out the sensitivity and specificity of Ziehl Neelsen" s staining. Auramine staining and Rapid Slide Culture technique comparing them with growth on Lowenstein Jensen's medium as gold standard

2. To do a qualitative estimation of antibodies against 38kda, 16kda, 6kda antigens of Mycobacterium tuberculosis in the serum of patients suspected of extra pulmonary tuberculosis.

3. To evaluate the role of the above multiple tests, for the etiological diagnosis of extra pulmonary tuberculosis.

Material and methods

The present study included 66 clinical specimens from patients suspected of extra pulmonary tuberculosis inclusive of HIV infected patients at R.L.Jalappa Hospital and Research Centre. attached to Sri Devaraj Urs Medical College, Tamaka, Kolar. The Patients whose sputum was positive for acid fast bacilli and diagnosed with pulmonary tuberculosis were excluded from the study.

The following extra pulmonary specimens Pleural fluid (29). Pus samples (I I), Lymph node aspirates (6), Biopsy specimens (6),Cerebrospinal fluid (CSF)(4). Synovial fluid (3) . Ascitic fluid (3), Urine(2), Bone marrow aspirate(:2) were collected. These specimens were subjected to ZN and Fluorescent method of staining, culturing by LJ and RSC method. and comparing growth on LJ medium as the gold standard. Blood specimens were collected for serological study for

detection of antibodies against 38 kda, 16kda, and 6kda antigens of Mycobacterium tuberculosis. The results were compiled and analysed. Statistical analysis was done and the sensitivities, specificities, were compared with the gold standard and the positive predictive values. and the negative predictive values were obtained.

Results

In the present study 57.5% were males and 42.5% were females and most of the patients belonged to the age group of 21-30 years. Mycobacterium tuberculosis was isolated in 24.1% and on Tuberculous Mycobacterium (NTM) was isolated in 6% of the 66 samples processed. Highest number of isolation was from lymph node aspirates (83.3%) .In pleural fluid the percentage of isolation was l3.8%, pus 27.8%. synovial fluid 33.3%. urine 50%. ascitic fluid 33.3% and biopsy specimen 16.7%,2%) of the samples were HIV seropositive.4(6%) of the samples were smear negative and culture positive. 3% of the samples were smear positive and culture negative.

The ZN method of staining had a sensitivity of 80%, specificity of 95.65%, positive predictive value of 88.89% and negative predictive value of 91.67%. The fluorescent method of staining had a sensitivity of 80% and a specificity of 95.65%1 positive predictive value of 88.89% and negative predictive value of 91.67%. RSC had a sensitivity of SO%. specificity of 100%, positive predictive value of 100% and negative predictive value of 92%.

Conclusion

RSC had sensitivity comparable with the sensitivity of smear microscopy by ZN and Fluorescent methods. RSC had a positive predictive value of 100% which indicate::: that the diagnostic potential of the test is good. However from the above findings it can be concluded that with a positive predictive value of 100% and sensitivity of 80% RSC is as good as LJ culture. The growth is obtained in 7 days and is useful in the early confirmation of viable Mycobacterium tuberculosis which makes it an ideal diagnostic test in a country like India where tuberculosis is rampant. From the present study it can be inferred that antibody e5timation does not play an important role in diagnosis of extra pulmonary tuberculosis

THE EFFECT OF SINGLE DOSE ORAL GABAPENTIN AS PREEMPTIVE ANALGESIA FOR POSTOPERATIVE PAIN AFTER TOTAL ABDOMINAL HYSTERECTOMY UNDER SPINAL ANAESTHESIA

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Background

Gabapentin is a structural analogue of gamma-amino butyric acid, which was introduced in 1994 as an antiepileptic drug and is also effective in neuropathic pain. Gabapentin is reported to possess antihyperalgesic and antiallodynia properties.

Aims of the study

Comparison of preemptive analgesic efficacy of Gabapentin with placebo in post operative period and to study the side effects with the drugs.

Material and methods

The study is double blind. Sixty normotensive patients of ASA grade 1 & 2, 30 to 65years, for total abdominal hysterectomy randomly divided on an alternative basis in to two groups of 30 each. Patients in Group-A (gabapentin) received Cap. gabapentin 300mg; Group-B (placebo) patients received matching placebo. Subarachanoid block performed at interspace L2-L3 or L3-L4 in all the patients. Inj Tramadol 1.5mg/kg as rescue analgesia for pain relief on demand. Pain was assessed by V AS and if VAS >4 rescue analgesic was given. V AS scores assessed on a scale of 0-10 (0 mean no pain. 10 equals to worst imaginable pain) after 2, 4. 8. 12 and 24hrs after the surgery. Total number of rescue analgesics received by each patient was noted.

Results

Demographic data in both group were not statistically significant. VAS score was less in Gabapentin group at 2.4, 12,and 24 hour compare to placebo. V AS score was higher in 8 hr in Gabapentin group compare to placebo(4.13 Vs3.27), that was because at that hour most of the cases in Gabapentin group received first rescue analgesic. The total amount of tramadol demanded after surgery in the first 24 hr in the GroupG(gabapentin) (120mg ± 43.43mg, mean ± SD) was significantly less than in the Group-P (placebo) (255.17mg ± 50.76mg, mean ± SD). The mean number of top ups requirements in gabapentin group is significantly less compared to Placebo group (1.3 Vs 2.7). Nausea and vomiting is significantly less in gabapentin group compare to placebo.

Conclusion

Single oral dose of gabapentin given 2hrs before surgery provides better pain control as compared to the placebo and also reduces the requirement of tramadol in patients undergoing total abdominal hysterectomy without any side effects.

PROSPECTIVE STUDY OF RETINOPATHY OF PREMATURITY IN LOW BIRTH WEIGHT AND PREMATURE BABIES AT KOLAR

Dr Bhavana
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Background/Objectives

To know the incidence, clinical spectrum and outcome following treatment of Retinopathy of Prematurity (ROP).

Materials and Methods

Prospective study of infants with birth weight < or= 2000g and/or gestational age < or = 34weeks from the period of 151 December 2008 to 31[51] May 2010. They were screened by indirect ophthalmoscopy using +20D lens between 2 to 3 weeks after birth.. The ROP was staged according to Revised International Classification of Retinopathy of Prematurity guidelines and followed up till the retinal vascularization was complete. Early Treatment Retinopathy of Prematurity guidelines were followed for laser treatment.

Results

The overall incidence of ROP was 38.6%. The incidence of APROP was 13.1 %,. The incidence of classical ROP was 86.8%. The mean birth weight and mean period of gestation was significantly lower in babies with ROP compared to those without ROP (1555. 91g vs 1672.50g) with t=2.85 1; (p value=0.005) and (32.23wks vs 34.58wks) with t=6.728 ;(P value <0.001) respectively. Few risk factors were present in higher proportion in babies with ROP when compared to babies without ROP, these were RDS (26.5% vs 14.6%), Oxygen (18.4% vs 8.7%), NNJ (32.7% vs 523.2%) and Sepsis (22.4% vs 15.9%) respectively. The above mentioned 4 risk factors may be clinically significant. Six infants (12 eyes, 13.1%) with Aggressive Posterior Retinopathy of Prematurity and six infants ~12 eyes. 13.95%) with classical ROP underwent laser photoablation using 532nm green laser. All (l00%) lasered eyes showed favourable outcome following laser photoablation. 23. 7% of our babies with Rap were weighing> 1500g. 32.2% and 15.2% of babies with Rap had period of gestation >30 weeks and >32wks respectively.

Conclusion

Our prospective study in a level IIINICU in a rural hospital reveals that timely and appropriate screening and treatment of Retinopathy of Prematurity results in excellent outcomes of babies with severe Rap. The Western screening guidelines are challenged by our results as we had 23.7% of infants with Rap whose birth weight was> 1500g, 32.2% and 15.2% of infants with Rap with paG>30 and >32 weeks respectively and show that it may not be applicable in rural neonatal care centers.

ORAL MISOPROSTOL VERSUS VAGINAL MISOPROSTOL FOR INDUCTION OF LABOUR AT TERM

Dr Preethi

Department of Obstetrics & Gynecology

Objectives

To study the safety of misoprostol as an induction agent in pregnancy and to study the efficacy of equivalent doses of misoprostol administered orally and vaginally for induction of labor at term.

Materials and methods

A total number of 100 cases of term pregnancies in R L Jalappa Hospital and Research center attached to Sri Devraj Urs University, Kolar during May 2008 to June 2010 was included in the study. This is 2 years prospective study comprising of 50 primigravida women & 50 multigravida women, each group alternatively induced vaginally and orally with 50 micrograms of misoprostol at sixth hourly intervals till the patient enters active stage of labor. A standard proforma was used to collect the data and informed consent was taken from each patient included in the study.

The study includes all women with term pregnancy, single viable fetus, intact membranes and cephalic presentation. It excludes patients in preterm labor, those with ruptured membranes and those who have undergone previous uterine surgeries.

Results

The most common indication for induction of labor was postdated pregnancy followed by hypertensive disorders of pregnancy. The comparison between the two routes of induction showed that the average induction delivery interval was longer in the oral group compared to the vaginal group. The incidence of Caesarean section was higher in the orally induced group compared to the vaginally induced group. The most common indication for Caesarean section was fetal distress. The dose of misoprostol used in the oral group was higher compared to the vaginal group. Need for oxytocin augmentation was also higher in the orally induced group as compared to the vaginal group. The incidence of failed induction in the oral group was more compared to none in the vaginal group. The incidence of adverse effects like nausea, vomiting & diarrhea was higher in the orally induced group compared to the vaginally induced group. Need for NICU care for newborn was marginally higher in the orally induced group as compared to the vaginally induced group.

Conclusion

Even though oral induction is an attractive option to initiate labor, it is not very effective to induce labor compared to .the vaginal route of administration.

CT EVALUATION OF PANCREATIC LESIONS

Dr. Ankita Chauhan
Department of Radiodiagnosis

Background/Objectives

To evaluate the pancreatic lesions by computed tomography (CT).

Materials and Methods

During the period of 18 months of the study, 39 patients who fulfilled inclusion criteria were studied by using SIEMENS SOMA TOM ESPRIT single slice spiral CT machine. The exposure settings used were 130 KvP and 100 mAs. Plain CT scan abdomen 10mm axial cuts were taken for all the cases. Oral contrast (10-15mLof ultravist in 2L of flavoured water) was given. After 45-60 min, Triple-phase contrast study of CT abdomen was undertaken by administering 80mL of ultravist @ 2.5mL/ s by a pressure injector.

Results

Contrast-enhanced CT abdomen study showed acute inflammatory changes in 21 cases (53.8 %), pseudopancreatic cyst in 14 cases(35.89%), chronic pancreatitis in 5 cases(12.8%),isolated pseudopancreatic cyst in 3 cases (7.69%), and tumor in 6 cases(15.38%). Maximum of the acute pancreatitis cases belong to Balthazar grade C (42.86%). Pancreas was found to be bulky, altered attenuation and peripancreatic fat strandings in significant number of cases, but necrosis, parenchymal or ductal calcifications, dilated duct, peripancreatic fluid, pancreatic infiltration by adjacent tumors, and adjacent vascular thrombosis/fat infiltration was found in only few cases.

Ascites and pleural effusion were noted in quite a number of cases. Diffuse fatty infiltration of liver, gallbladder calculus and common bile duct dilatation was seen in only few cases.

Conclusion

The results of the present study show that Helical Computed Tomography of the abdomen has improved the visualization of pancreas, more so in cases where pancreasis obscured on ultrasonography by poor acoustic window owing to excessive bowel gas. It not only enables proper assessment of pancreatic size and morphology, but also hepatobiliary system, vasculature, spleen, bowel loops, and even bases of lungs can be assessed and commented upon in the same setting.

SERIAL SERUM C-REACTIVE PROTEIN LEVELS FOR THE DIAGNOSIS OF NEONATAL INFECTION

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Department of Pediatrics

Back Ground

Neonatal sepsis accounts for the majority of neonatal morbidity and mortality especially in the developing countries including India. Neonatal sepsis requires rapid and accurate diagnosis as well as treatment for the improved outcome. There is an increasing need for careful evaluation of neonatal sepsis in early period.

Objective

To evaluate serial serum C reactive protein levels for the diagnosis of neonatal infection.

Method

A total of 50 neonates with clinically suspected neonatal infections is evaluated. The neonates are evaluated by thorough history from mother and detailed clinical examinations. The findings are recorded in the Patient record form. Laboratory and radiological evaluation is done for the diagnosis and confirmation of infection. Infants are categorized as having proven sepsis, probable sepsis or no sepsis, without consideration of CRP levels. CRP levels are determined at the initial evaluation and on each of the next two mornings. Sensitivitv. specificitv and predictive values are calculated for the first and second CRP (l and 2).

Results

In the present study, 5% case of proven sepsis and 95% cases of probable sepsis is present among CRP1 positive cases with significant correlation ($p<0.05$). While 9.3% cases of proven sepsis and 90.6% cases of probable sepsis is present among CRP1 and 2 positive cases with highly significant correlation ($P<O.OOl$), indicating that serial CRP monitoring had clinical utility in diagnosis of neonatal sepsis. Further comparative analysis of CRP and culture of the body fluid showed that serial measurement of CRP 1 and 2 showed increase in sensitivity from 25.0% to 100%, NPV from 90% to 100% and PPV was increased from 5.0% to 9.3% but decrease in specificity from 58.69% to 15.21 %. The serial CRPI and 2 measurements showed higher sensitivity and negative predictive value compared to CRP1 alone, in both early as well as late proven and probable sepsis.

Conclusion

As the culture positivity rate are low and takes time for growth, serial CRP levels can be used in the diagnostic evaluation of neonates with suspected infection. Further serial CRP levels are more sensitive than single CRP measurement.

A STUDY OF SURGICAL MANAGEMENT OF INTERTROCHANTERIC FRACTURE OF FEMUR WITH DYNAMIC HIP SCREW

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Department of Orthopaedics

Background and Objectives

Inter trochanteric fracture is a leading cause of hospital admissions 111 elderly people. The number of such admissions is a rise because of increasing life span & sedentary habits. Conservative methods of treatment result in malunion with shortening and limitation of hip movement as well as complications of prolonged immobilization like bed sores DVT and respiratory infections. This study is done to analyze the surgical management and traumatic fractures using Dynamic Hip screw.

This is a prospective study of 30 cases of fresh intertrochanteric fractures admitted to R.LJalappa hospital attached to Sri Devaraj Urs Medical College, Kolar, between September 2008 to September 2010. Cases were taken according to inclusion and exclusion criteria i,e., patients with intertrochanteric fracture above the age of 18yrs. Medically unsuitable and old malunited intertrochanteric fractures were excluded from the study. Operation was done keeping the Tip Apex Distance (TAD) into consideration.

The study shows sex ratio of 7:3 (M:F) with maximum presentation between 51 to 65yrs with an average of 54yrs. Mode of injury was more due to fall, 24(80%); followed by RTA, 6(20'%). Right side was slightly more than Left side. R:L = 19 (63.31k): 11 (36.61jr). 13.3% of patients had associated injury. Type II fractures were maximum with 19 cases followed by type III&I 5& 4 cases each, Post operative results were found to be excellent in 6(20%), Good in 13(43.3%), Fair in 10(33.3%) and poor in 1(3.3ik).

Conclusion and Interpretation

This study shows that intertrochanteric fracture is common in elderly population with male preponderance mainly occurring between 51-65 years, Common mode of injury being trivial fall, right side being slightly more involved in II 1 Jury. Early operative intervention with Dynamic hip screw with 135^0 side plate with barrel gives good results, helps early mobilization of elderly patients decreasing morbidity & mortality and achieves rigid fixation even in osteoporotic bone.


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