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GOA STATE CHAPTER

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EDITORS NOTE

Greetings to our fellow pediatricians.

In the last 4 months the entire world is falling prey to a deadly microbe which has taken more than a billion lives. The Coronavirus outbreak has posed serious challenges to India's healthcare community, but responses from affordable medical care devices to interactive apps are emerging. Companies are reinventing themselves to survive and even thrive while new oppurtunities open up in online education, entertainment and collaboration. We the frontline workers need to take utmost care and precautions to remain safe and to protect our near and dear ones while serving our patients.

In this 10th issue of IAP Goa state chapter E- Bullletin we bring to you interesting articles and case reports like Neonatal Parotitis, case study of MSUD, approach to an Adolescent patient, Interpretation of LFTs, correlation between IgE and Allergy, case study of choledochal cyst and a special article on Medical Genetics in Clinical Paediatric practice.

I would like to thank everyone for contributing your articles to our e- bulletin inspite of your busy schedule thus contributing to our continuous learning process. . I hope you will enjoy reading it and give us your valuable feedback.

Stay safe and happy reading

Warm regards

Dr Priyanka Kamat Dhakankar

MEDICAL GENETICS IN CLINICAL PRACTICE

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Abstract

Medical genetics is an upcoming field and has already been recognized as a clinical speciality. However many paediatricians are still ignorant about the utilization of medical genetic services for diagnosis and counselling of patients and families with genetic disorders. This review focuses on the importance of Medical genetics as a clinical speciality and its ramifications with respect to other clinical specialities. A brief overview of human genetic disorders is also presented.

MEDICAL GENETICS IN CLINICAL PRACTICE

"Life is an orchestra that is played by 100 trillion cells, with about 30,000 genes each, from womb to tomb; yet, it is a symphony and not a cacophony."

Mankind has been battling with diseases since time immemorial. However, the priority areas have been changing due to development of new therapeutic options. With the advent of vaccines and antibiotics, we have successfully eradicated few diseases and others are in process. Hence now the focus is shifting towards non communicable diseases and India is witnessing an accelerating shift towards this direction. Genetic disorders form a major group of the non communicable diseases. Congenital malformations and genetic disorders are the third commonest cause of mortality in neonates in cities.

Genetics is a branch of since that deals with study of genes. Its origin is credited to discovery of principles of inheritance by the Austrian monk, Gregor Mendel, in 1865[1]. Medical Genetics is the application of this knowledge for understanding etiology and pathology of human disease, while Clinical

Genetics is its application for diagnosis and management of patients with genetic disorders.

However, in spite of more than several thousand genetic disorders known, the medical genetics has failed to interest clinicians in our country, probably because of an erroneous impression that genetic diseases are rare and nothing can be done for them. It is not true! The genetic diseases, including congenital malformations, chromosomal syndromes and single gene disorders affect up to 4-5% of all live births. And if polygenic predisposition to complex diseases of adult onset is included, the burden of genetic disease is considerably high. Regarding management, there have been remarkable advances during last three decades in diagnosis and treatment of genetic disorders. This includes antenatal diagnosis for more than 5000 genetic diseases as well as screening for primary prevention of several of them. In fact, the discipline of medical genetics has already emerged as a clinical specialty. Furthermore, what is happening in the field of human genome today is likely to revolutionize the whole practice of medicine tomorrow. Identification of genetic predisposition factors will greatly assist in identifying genes that predispose to diseases like coronary artery disease, hypertension, cancer etc. paving the way for identifying individuals at risk much before the onset of disease and preventing it by appropriate intervention.

Estimates for genetic disorders show that 4,95,000 infants with congenital malformations, 3,90,000 with G6PD deficiency, 21,400 with Down syndrome, 9,000 with β-thalassemia, 5,200 with sickle cell disease and 9,760 with amino acid disorders are born each year in our country. Extrapolating the same to the state of Goa would reveal that out of 25,400 births in the state, 500-700 children are born with congenital malformations, 25 with Down syndrome, 10 with Thalassemia, 4 with Sickle cell anemia, 8 with amino acid disorders and at least 250-500 children with some single gene disorder every year. The burden of these disorders has its effects on the economic and social structure of the society. The various factors influencing the high prevalence of these disorders include consanguineous marriages, high birth rate, improved

diagnostic facilities, poor governmental support facilities, and lack of expertise in genetic counseling.

Genetic diseases are encountered by physicians in almost all medical specialities. Knowledge of their existence will be helpful so that early referral to a genetic specialist may help the family regarding their options for therapy and prenatal diagnosis of these disorders. Here is a list of genetic disorders commonly seen in clinical practice of various specialities[2]:

Hematology: Beta-thalassemia, Sickle cell disease, hereditary spherocytosis, Hemophilia, von Willebrand disease, Glucose-6 phosphate dehydrogenase (G-6PD) deficiency etc.

Cardiology: Chromosomal disorders, Di George syndrome, William syndrome, Noonan syndrome

Neurology: Chromosomal disorders, Phenylketonuria, Hereditary spinocerebellar ataxias, Huntington chorea, Duchenne muscular dystrophy, Myotonia dystrophica, acute intermittent porphyria etc.

Respiratory medicine: Cystic fibrosis, Alpha-1 antitrypsin deficiency etc.

Gastroenterology: Familial polyposis coli, Wilson's disease, Gilbert's syndrome, Hemochromatosis etc.

Nephrology: Polycystic disease of the kidney, renal tubular acidosis etc.

Orthopedics/Rheumatology: Achondroplasia, Marfan syndrome, Osteogenesis imperfecta, Vitamin D resistant Rickets, Mucopolysaccharidosis etc.

Single gene disorders

Individual monogenic genetic diseases are rare (1 in 10,000 to 15,000 births), but collectively they can affect up to 1-2% of all births. Some conditions are highly prevalent in selected populations e.g. Sickle cell disease in the Africans, Cystic fibrosis in the Caucasians and thalassemia in the geographical belt extending from the Mediterranean countries to South-East Asia. Compared to the general population, the risk of occurrence of genetic diseases in affected

families is very high. It is determined by Mendelian principles of inheritance. However, previous occurrence of disease in the family is not necessary. The defect may arise de-novo for the first time in any individual (spontaneous mutation) or there may be silent carriers in the family who give birth to an affected child without a positive family history (Autosomal recessive disorders). Although in most instances genetic diseases manifest early in childhood, they may appear late in life as well, e.g. Huntington chorea which usually manifests at 40-45 years of age.

Chromosomal disorders

Besides single gene defects, there can be numerical or structural abnormalities, of part or whole of the chromosome which give rise to disease. The most important example is Down syndrome which occurs in 1 out of 800 births. It is caused by an extra chromosome 21 so that there are three 21 chromosomes (trisomy) instead of two and the total number of chromosomes is 47 instead of 46. Overall prevalence of various chromosomal abnormalities in the newborn is about 0.5%. Chromosomal abnormalities are also frequently found in cancer cells and are a common cause of spontaneous abortion. Unlike single gene disorders, the numerical chromosomal defects are not transmitted in Mendelian fashion.

Polygenic disorders

A third category of genetic diseases are those where genes are predominantly responsible for predisposition to disease but by themselves are not sufficient to cause the disease. Multiple genes (polygenic) usually determine this predisposition, while occurrence of the disease is precipitated by environmental factors. These diseases are thus multifactorial in origin and include most of the common diseases of adult life such as: Hypertension, Allergy, Coronary artery disease, Autoimmunity, Diabetes, Psychiatric diseases, Obesity etc.

Recent advances in mapping of human genome have opened the possibility of identifying major gene(s) that predispose to these disorders.

Identification of carriers of the abnormal gene(s), by direct DNA analysis before the onset of the disease, could provide an opportunity of targeted counseling and prevention of these diseases. This approach is going to add an entirely new dimension of predictive medicine to the practice of modern medicine.

Genetic Counseling

The American Society of Human Genetics, in 1975, has defined genetic counseling as "a communicative process which deals with human problems associated with the occurrence and/or recurrence of a genetic disorder in a family". This process of genetic counseling involves an attempt by one or more appropriately trained persons to:

1. Help the patient/family to comprehend the medical facts, including diagnosis, prognosis, probable course of disorder and available management options.
2. Help the family/patient to understand the way heredity contributes to the disorder and the risk of recurrence in relatives.
3. Understand the alternatives for dealing with the risk of recurrence and options for prenatal diagnosis.
4. Choose the course of action, which seems to them appropriate in view of this risk, their family goals, and their ethical and religious standards and to act in accordance with that decision.
5. Make the best possible adjustment to the disorder in an affected family member and/or to the risk of recurrence of that disorder.
6. Provide social and psychological support to the affected family.

Preventive genetics

Prevention of genetic disorders is the only way of decreasing the burden of these diseases. Since most of the genetic diseases are not treatable, the only option is to prevent the birth of these children by diagnosis during pregnancy

and termination of pregnancy in affected cases before 20 weeks. Down syndrome and thalassemia are two common genetic diseases for which tests are easily available to couples and thus can help in prevention of these disorders.

Down syndrome is a disease in which the child is born with multiple birth defects, heart defects and mental retardation. There is no treatment available. One in 800 couples is at risk of having a child with this disease. It is caused due to an extra copy of chromosome number 21. Recently, non invasive tests have become available which can identify women at risk of having a child with Down syndrome. Those found to be at risk have to undergo another confirmatory test by analysis of amniotic fluid around the fetus in the womb. If the fetus is found to be affected then termination of pregnancy can be done before 20 weeks.

Thalassemia is another common genetic disease caused due to abnormal blood formation. The disease can be cured only by Bone marrow transplantation. This treatment is very costly (Rs 15-20 lakhs), difficult and is available at only few centers in India. Further this treatment can only be done in children who have a matching bone marrow in their brother or sister. The other type of treatment which is commonly used is blood transfusion every three weeks for life. This type of treatment leads to a lot of problems for the families with children with thalassemia since they have to travel every month and spend for the transfusion. Hence only few of the children are able to avail of this treatment properly. Most of the children get inadequate treatment and do not live beyond 10-20 years.

The disease occurs when carriers for defective thalassemia gene marry and have children. The carriers can be easily detected by doing a blood test called hemoglobin electrophoresis and if both the parents are carriers then testing during pregnancy is done by checking for the defective gene in the fetus. Some countries like Cyprus, Sardinia have completely eradicated thalassemia by carrier screening of population.

Apart from these common diseases, there are a large number of genetic diseases for which diagnostic and prenatal diagnosis facilities are now

available. A nationwide network of Genetic Centers capable of providing diagnosis, counseling and testing during pregnancy is the need of the hour. Similarly there is paucity of trained individuals in this field and unless qualified experts are available for counseling of families with genetic diseases, the control of genetic disorders will remain a distant dream.

Some aphorisms in Medical Genetics

(Adapted from Handbook of Medical Genetics, 2000, SGPGIMS, Lucknow)

- All genetic diseases are not congenital and vice versa.
- All genetic diseases are not familial and vice versa.
- Absence of genetic disease in the family does not mean that it cannot occur in the family.
- Each one of us is a carrier of 6-7 deleterious recessive mutations.
- All genetic diseases are not rare (e.g. Cystic Fibrosis, Thalassemia etc.).
- Consanguinity predisposes to autosomal recessive disorders, but overall prevalence of genetic diseases in populations with high consanguinity need not be high.
- Risk of recurrence may vary from 0 to 100%. A genetic disease for an affected individual need not be transmitted, e.g. chromosomal disorders, somatic cell genetic disorders.
- All genetic diseases are not non-treatable
- Genetic disease is not a curse. It should not be treated as social stigma. There should be no discrimination of genetic carriers for jobs, insurance, marriage etc.

References:

1. Peter Turnpenny, Sian Ellard. Emery's Elements of Medical Genetics. 2007, Churchill Livingstone.
2. L. Nussbaum, Roderick R, Huntington F. Thompson & Thompson Genetics in Medicine, 2004, 6th Edition, Saunders.
3. Verma IC, Bijarnia S. The burden of genetic disorders in India and a framework for community control. Community Genet. 2002; 5(3):192-196.
4. Verma IC, Saxena R, Lall M, Bijarnia S, Sharma R. Genetic counseling and prenatal diagnosis in India--experience at Sir Ganga Ram Hospital. Indian J Pediatr. 2003; 70(4):293-297.
5. Biesecker BB, Peters KF. Process of studies in genetic counseling; peering into the black box. Am J Med Genet 2001; 106:91-98.
6. Phadke SR, Pandey A, Puri RD, Patil SJ. Genetic Counseling: The impact in Indian Milieu. Indian J Pediatr 2004;17(12):1079-1082
7. Agarwal SS, Phadke SR. Handbook of Medical Genetics, 2000, SGPGIMS, Lucknow

CASE REPORT ON NEONATAL PAROTITIS

- Dr Dhruthi Ramesh, Dr Kavita Sreekumar

INTRODUCTION

Salivary gland infections are uncommon in neonates. Most common organism causing it is Staphylococcus aureus. In this case, we are presenting a 16 day old term male baby, who presented with acute parotitis.

Case report:

Baby was born to Primigravida at 39.2 weeks of gestation by spontaneous vaginal delivery.

Birth weight: 2.29kg

Cried at birth. Apgar at 1 and 5 minutes of life was 8 and 9 respectively.

Had an uneventful immediate postnatal period. Exclusively breastfed and discharged on 5th neonatal day.

Baby was brought by the mother on 16th neonatal day with complaints of noticing redness and swelling over the right pre-auricular region for 1 day.

There was no history of any discharge from the site or from the ear.

No history of fever/decreased feeding/decreased activity/vomiting.

On examination , baby was irritable. Axillary temperature was 98.9*F.

On local examination, diffuse erythema, swelling and induration was noted in the right preauricular, infraauricular and postauricular region with increase in local temperature. Fluctuation was absent.

Left ear and surrounding region appeared normal.

Systemic examination was otherwise uneventful.

Laboratory tests revealed Hemoglobin 16.2, Pcv 49%

TLC- 11500(N-54, L-34)

BU 15, SC 0.3, Se Na-133, Se K-5.7, Se Cl-105

Ultrasound of the parotid glands demonstrated bulky right parotid gland with an ill-defined hypoechoic area measuring 16*22 mm, with increased vascularity. A hypoechoic region was also present adjuvant to the right parotid in close proximity with the underlying bone. Diffuse overlying subcutaneous edema seen in right submandibular region. Few submandibular non-necrotic lymph nodes were seen. Left parotid region appeared normal. Imaging features were suggestive of infective etiology.

ENT and Paediatric Surgery opinions were taken. Baby was started on Ampicillin, Amikacin and Metronidazole. 2 fever spikes of 99.6 degrees Farenheit were noted on day 3 of treatment, hence Ampicillin was then upgraded to Vancomycin.

Following antibiotic therapy, baby showed clinical improvement. Swelling and erythema subsided. No further fever spikes. Baby's activity improved. Surgical intervention was not undertaken in view of adequate response to antibiotics.

DISCUSSION:

Acute bacterial parotitis is rare in the neonatal period. It is more prevalent among males. The parotid gland is more frequently infected compared to other salivary glands because of its exclusive serous secretions without the bacteriostatic properties of the mucoid component.

Although acute parotitis may affect normal healthy neonates, it seems to be more common in premature infants with low birth weight. This is presumptively due to higher risk of dehydration, which may reduce salivary secretion, causing stasis, which promotes bacterial ascent along the salivary duct. Bacterial seeding of parotid gland can also occur hematogenously.

Other risk factors include nasogastric intubation, sepsis, structural glandular abnormalities, cephalic or facial trauma, and immunodeficiency states.

Staphylococcus aureus is the most common organism causing it. Other less common ones are other gram positive organisms, gram negative bacilli, and rarely anaerobic organisms.

The diagnosis is clinical. Purulent discharge from Stensen's duct is pathognomonic of acute suppurative parotitis. Other symptoms are gland swelling, erythema, local rise in temperature. Fever is present in minority of cases.

Most useful investigations are pus culture and ultrasound of the parotid region.

Differential diagnosis includes facial skin cellulitis, lymphadenopathy, osteomyelitis, fat necrosis , buccinators muscle infection.

Treatment consists of IV antibiotics, for 7 to 10 days. The initial empirical treatment must include an antistaphylococcal antibiotic. The increase in MRSA may require Vancomycin. The treatment may include an anti anaerobic. Surgical treatment is rarely necessary. Correct hydration is essential.

Prognosis is favourable in most cases. Complications are rare and include facial paralysis, salivary fistula, mediastinitis, and external ear infection. If there is no clinical improvement with antibiotics in the first few days , imaging is to be repeated and need for incision and drainage of abscess may have to be considered.

IgE & ALLERGY

- Dr Dhanesh Volvoikar

It is common belief among General Physicians that if Total IgE is raised it is confirmatory test for Allergy. But it is serum Specific IgE (sSIgE) and not total IgE which has significant role in diagnosis . And each antigen produces its own specific IgE.

Whenever a foreign substance or microorganism enters the human body it is usually neutralised by IgM & IgG antibody. But in case of people prone to allergy body produces IgG which is specific to particular antigen. Eg. For D. Ferinae House Dust Mite (HDM) Specific IgE to D.Ferinae mites will be produced, which after being freely circulated in blood stream will get attached to tissue mast cell. This specific IgE which can be in minuscule amount (0.35 to 100ku/L) is usually tested by SsIgE test when it is being freely circulated in blood. SsIgE can constitute negligible amount from Total IgE which can be produced in body in huge amount in response to variety of conditions. Hence identification of elevated Total IgE as opposed to specific IgE in serum is of little diagnostic value. The reason is that mitogenic factors in viruses (eg Cytomegalovirus, Epestein Barr virus), Bacteria (eg Staphylococcus), Helminth (eg Ascariasis) and adjuvant factors in air pollution (eg Cigarette smoke, diesel exhaust) stimulate the production of IgE molecule without initiating any allergen specific IgE sensitization.

Serum specific IgE after briefly circulating in blood gets attached to tissue mast cell and blood basophil. And when particular antigen comes in contact with it stimulate antigen-antibody reaction. This causes degranulation of mast cell leading to release of mediators of inflammation like histamine, prostaglandins, leukotrines etc and causes an allergic reaction which can be just a rash, itch, sneeze to severe form of status asthmatics and anaphylaxis. This reaction is demonstrated by doing SPT using negligible extract of particular antigen. Hence SPT is a simple and effective method of diagnosing causative allergen. Since SsIgE detect blood levels it can be false positive as only when IgE get attached to mast cell can cause clinical reaction if it comes in contact with specific antigen. Both SPT & Specific IgE has its own Pros & Cons as crude extract is used for detecting causative antigen. Once molecular

allergy testing becomes available many of these issues of cross reactivity and others will be tackled. But as of now it is not available in India. Although Provocation Test and Food Challenge are gold standards they cannot be done in each and every case because of logistic reasons and can even stimulate a severe reaction. Final decision of detecting the causative allergen always rests with detail clinical evaluation correlating with positive test available in our armamentarium. Although detail evaluation has to be done in a sophisticated allergy clinic the idea of this article is to know how much the general physician can use SsIgE in routine practice.

Radioallergosorbant test (RAST) by Immunocap method of detecting SsIgE is the most reliable. One should not rely on ELISA and other methods which are thrown in market. They yield non specific results and are not cost effective. The so called "Infant & Adult screening test" using secretly mixed antigen are also not recommended by any standard guidelines. So which antigens test to ask for by Immunocap method depends on detail history and patients clinical condition along with detail knowledge of local environmental condition, aerobiology of pollens etc.

For Example, if one suspects Cow's Milk Protein Allergy SsIgE for Milk can be a reliable Test. But detail knowledge is required when you want to ask for multiple allergens. Hence it is always better to undergo Skin Prick Test and SsIgE can be done for clinical correlation if it is necessary.

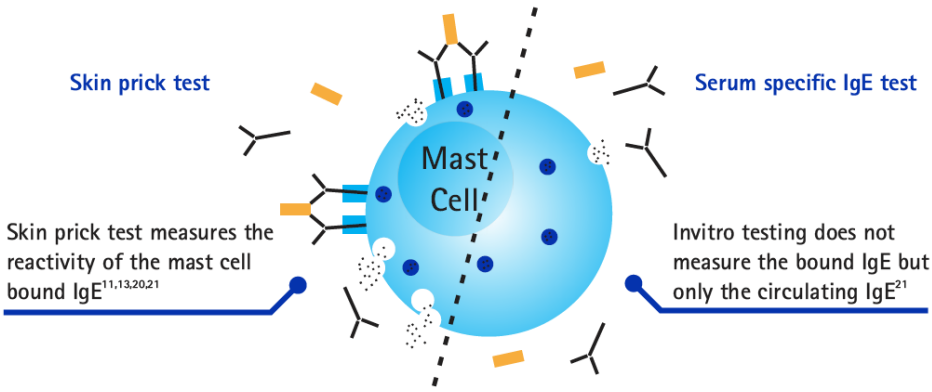
No standard guidelines are recommended for Atopic Dermatitis, Allergic Rhinitis or Asthma panels and on most occasion can be misleading. One require local allergen knowledge based on aerobiology of local pollens and other common antigens based on local studies and environmental conditions if at all one needs to investigate by doing SsIgE in place of SPT. Also it is pertinent to know that these available panels contain most of the allergens relevant to western world. For Example, respiratory allergy in geographical region with humid climate of Goa Dust Mites constitute almost 60-80% as causative antigen. Both main mites D. Ferinae & D. Pterosynnesssis can be tested. 3rd major dust mite Blomia Tropicalis which is not usually found in western world is not available for SsIgE testing. The preschool child is usually exposed to indoor allergens and along with mites, cockroach, and indoor fungus like aspergillus & alternaria, few allergenic food like milk, egg, wheat, soybeans, prawns, fish, shell fish, groundnuts and tree nuts like almonds can be tested. School going child requires pollens to be included. In Goa grass pollens and weeds like parthenium hysterophorus and amaranthus spinosis contribute as major allergenic pollens. As per seasonal history of allergy symptoms one

need to test few more tree pollens. Pet allergen can be included if history is suggestive.

In view of exorbitant cost of SsIgE (Approximate cost Rs 1500/antigen as of now) skin prick test which has more positive predictive value scores over specific IgE. In some cases of investigation of severe anaphylaxis and if anti histaminines cannot be stopped which is a prerequisite for SPT, specific IgE test can be done. Absolute eosinophilia count also can be false +ve if allergy is suspected since it can be raised in variety of manifestation from worm infestation to malignancies.

Specific Allergy Tests do have a significant role up to certain extent and can be used by physicians not trained in allergy for clinical evaluation of their patients. Final diagnosis can always be done in an allergy clinic.

Skin prick testing has better sensitivity than IgE testing



Available at http://www.worldallergy.org/professional/allergic_diseases_center/allergy_diagnostic/, accessed on Dec 2 ,2014
Bernstein IL et al. Ann Allergy Asthma Immunol. 2008 Mar;100(3 Suppl 3):S1-148
Heinzerling, et al. Clinical and Translational Allergy 2013, 3:3
O'Brien RM, et al. Australian Prescriber 2002;25(4):91-93

DEDICATION, SUCCESS AND SMILES.....

Dr Santosh Usgaonkar

Have heard a saying " Work Hard in Silence, Let Success be your Noise"... Let us know a little about a person who believes in such a saying and takes all challenges in his stride. The person I am talking about is **Dr. Narayan a/s Santosh Usgaonker.**

Born on **1st December 1951 at Panaji**, to **Mr. Shantaram N. Sinai Usgaonkar** and **Mrs. Indirabai S.S.Usgaonkar,** being youngest of the 8 siblings, been brought up in a well settled and comfortable background by his parents. Dr. Santosh says, " His most influential and key figure in progress has been his father, towards whom he always has looked upon for his honesty, hard work, sincerity towards profession and being a silent support always. Academic journey began in Ponda, Goa, from A .J.De Almeida High School, later joined Chowgule College in Science stream till Inter Science. Entered the field of Medicine in 1970 and progressed to become DCH in 1978, but couldn't pursue his MD Paediatrics in Bombay due to ill health of his father hence Dr Usgaonkar opted for Senior Residency in the, Paediatric Department till 1980. He had to leave Goa Medical College, to start his own Private practice along with wife Dr. Purnima Usgaonkar at Ponda in 1980, at a time when Paediatric speciality was unknown in the area which began initially as a Clinic with admission at Dr.Shirsat Hospital and eventually started their own small venture in 1982, which was expanded further step by step as per the professional needs to the present status - Usgaonkar Children Hospital, Clinic & NICU. In 1996 a separate NNU was started with introduction of CPAP and later Dr.Santosh after acquiring proper training at Sagar Apollo, Bangalore, got ventilators installed in the NICU in 2004. Has been upgrading himself on this front at regular basis ensuring that he and his team can regularly provide appropriate facilities and services to patients . He says" Our aim has always been deeply focused on quality of healthcare and making it affordable and available to the community at large"

His life revolves around patients especially neonates that's what was gathered from the tet a tet.
His face glows when he narrates about the 575gm, 26 weeks preterm baby, with intact outcome and no neurological deficit then and at further follow ups too. Also he feels their greatest achievement was intact survival of a disregarded 600gm baby who is now a graduate working in a company – this was in a timeline when there was no much advancement in field of neonatalogy.
A set of ultra preterm triplets managed by him ,weighing between 800 gm to 1.3 kg recently surprised him by scoring unbelievable 94-96% in their SSC (CBSE) examination . Besides this there are many Paediatric cases worth narrating. He says these kind of cases with positive outcomes keep him going to do more and is very much satisfied with what he has achieved in his career.

He doesn't speak much whilst in the clinic but kids love him, and many of them affectionately call him Dotormama ,Doctor Aba.
As a child he was completely different would love to play more, was socially active and spent less time with books, would spend time with his childhood buddies, specially Mr. Pramod Sheyte (sadly no more with us) and Mr. Rajendra Nadkarni with whom he still shares a pretty strong bond. Later on books became his friends and he says "I realized how to strike the perfect balance".
Science being his favourite subject, he would love to experiment. Reading, going for walks have been his favourite ways to pass time and to add to it now he watches TV.

Behind every successful man there is a woman and behind this man too is his strong willed Dr. Purnima Usgaonkar. In December 1979, they got married both have been together through thick and thin in this graph of their career and otherwise. It was because of Dr. Purnima's constant support and encouragement in his career; and her constant needful care at the hospital and home front inspite of all odds in her own health path, that he could manage to give undivided attention and do justice to his profession.
As years passed by; family grew he is blessed with 2 daughters, in 1981- Dr. Anar Timble (Orthodontist, has her own private practice); married to Dr. Rajdatta Timble (Paediatrician has his own private practice besides being associated with him in his hospital) and in 1984-Dr Siddhi Nevrekar (Paediatrician, associated with him in the same hospital) ; married to Dr. Ramnath Nevrekar (Assistant Professor of Medicine at GMC). He is the proud grandfather of Ishaan (11years) And Avyaan (4 years) Timble ; and Shubh(8 years) and Stuti (6 years) Nevrekar with whom he loves to spend time. He is of course their favourite Pappajo.



Being a workaholic he spends most of the time in the Hospital premises and loves this place; seldom has taken off for an outing, " I am not sure whether that's a good thing or bad" he ponders .But Dr. Santosh has been part of many social camps providing his services to the needy and general public. Has been associated with well-known NGO Matruchaya providing free treatment and services for the orphan newborns and kids as and when needed for the past 30 years, and has played a very pivotal role in starting the project of IMA Ponda Charitable Trust, named DILASA - A Centre for Palliative care, he being the Chairman of the Association. He has been the resource person at Conferences, been in the advisory board for IAP Goa Chapter, and also of IMR Review committee.
He is the founder member of IAP Goa State Chapter and past EB member of CIAP 2017.
He has been felicitated by IAP Goa Chapter and also by IMA Goa State for his contribution in the field of community health of Goa. Also has received IMA Best Branch President Award and has been felicitated by the Ponda branch.

After 40 years of practice he says he is satisfied with his work in this noble profession. He smiles pleasantly, when he talks about the hospital saying, "I

love my work and enjoy every bit of it". He owes a lot to his inspirations Dr. Harish Mazumdar Professor of Paediatrics, who taught him how to interact and learn, Dr. Sunita Gaunekar Asst Professor of Paediatrics, who taught him how to go about in basic clinical Paediatrics, his parents who worked towards the cause with perseverance and dedication, and his wife for her ability to manage things efficiently , accurately and with undeterred consistency .

He has always been happy but now he is contended that his family is settled. He is proud of his daughters and sons in laws. His younger daughter Dr.Siddhi has become his right hand managing NICU as well as other patients to his satisfaction and he sees in her the future of his hospital of course ably shouldered by Dr. Rajdatta his elder paediatrician son in law. He is equally confident and proud of his elder daughter Dr.Anar who too alongside her busy orthodontic clinic ,shoulders the admin of the hospital to a great extent and proves to be a big support and relief for him in these days of increasing admin work demand from hospitals. And of course his younger son in law though not connected to the hospital yet remains to be a great advisor in times of academic needs whilst managing a grown up child patient .He is relaxed and confident that this younger team will do justice to the hospital for the years to come.

He believes in God and has faith and respects Him a lot but doesn't have any religion bias. He firmly believes that there are no shortcuts to success.

His favourite quote and preaching is "GOD HELPS THOSE WHO HELP THEMSELVES"

When asked about key to successful life he says:

"Dedication, Perseverance, Attitude play an important role. Intelligence is Secondary. Attitude is Primary. Time Management is absolutely important to achieve your Goal"

Don't Give up easily!!!

LFT INTERPRETATION IN PEDIATRICS

- Dr Harshad Kamat, MD,DCH,DNB

The objectives of this presentation is to-

1) Know the importance of various components of Liver Function tests
2) Understand Patterns of Liver Dysfunction
3) Apply it in clinical scenarios

Although the term "Function" is used in LFT(liver function tests), these tests are more a mix of liver injury indicators, and some synthetic, excretory and metabolic function of the liver. They help us to identify a liver injury; distinguish the type of liver disease; assess the severity and progression of the disease; and monitor the response to therapy.

But, they have limitations too. They lack sensitivity and specificity; only a handful of liver function can be assessed and no specific diagnosis can be made only on the basis of LFT.

Categories-

1) Tests for Liver Cell injury- **AST,ALT**
2) Tests for detection of impaired bile flow or Cholestasis- **ALP,GGT**
3) Tests for Liver synthetic capacity- **Albumin, INR/PT**
4) Tests for hepatic excretory function- **Bilirubin, Bile salts**
5) Test for liver metabolic function- **Ammonia**

Let us understand each of these better.

1)Transaminases- ALT(SGPT), AST(SGOT)

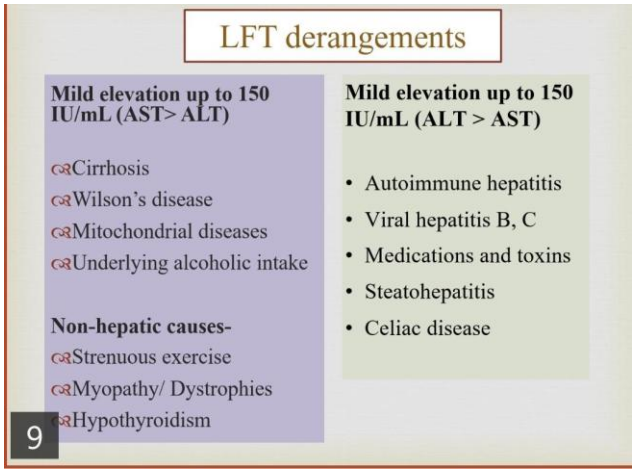
These are the most sensitive indicators of liver injury. **ALT is more liver specific** as it is in the greatest concentration in the hepatocytes. AST is present, besides liver, in other tissues also as in skeletal and cardiac muscles, kidney, brain, bone, placenta, WBC, RBC, Intestine. Hence, generally ALT>AST is suggestive of hepatic disease. But, it is not always so.

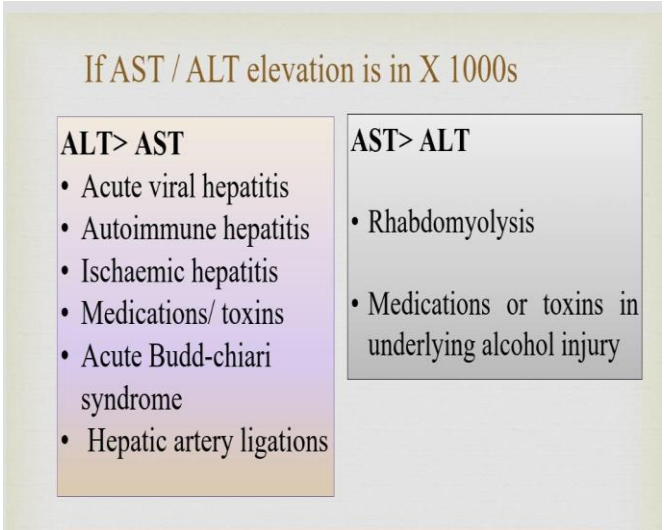
In the hepatocyte, **ALT is more in the cytosol**; wheras **AST in mainly in the mitochondria**. Hence, it is pertinent to note that in liver disease which is caused by drugs and metabolic disorder, where mitochondrial damage is more, AST will be higher then ALT. Hepatitis, which is the prototype cytosol disease

will have ALT higher then AST. Isolated AST elevation would suggest extra hepatic causes.

Usually, elevation of transaminases by 3 times of normal would be considered as significant in ACUTE disorders. Now, we have a new normal. Recent recommendations based on the SAFETY(Screening ALT for elevation in Today's Youth) study have suggested a **cutoff for ALT of 25IU/ml for boys and 22IU/ml for girls.** This is to prevent missing out transaminitis in chronic liver disease where even figures of 40-50 would be considered as elevated.

The AST/ALT ratio, which is a helpful ratio for alcoholic liver disease in adults, has not been studied well in children with the exception of Wilson's disease , wherein in its fulminant presentation AST/ALT ratio of 4 is often found.





The combination of rapid ALT/AST fall + Rise in Bilirubin and PT/INR with clinical deterioration is highly ominous and suggestive of hepatic failure.

2) **ALKALINE PHOSPHATASE**

ALP is located on the canalicular membrane of hepatocytes, bone osteoblasts, enterocytes in small intestines, Proximal convoluted tubule of the kidney, placenta and WBC. Mean ALP is higher in males, adolescents and growing children.

Elevation of ALP is noted in both intra and extra hepatic obstruction. But its elevation is not specific to hepatic causes.

Extrahepatic causes of increased ALP- pregnancy, renal failure, blood group B and O. These need to be considered in isolated increase of ALP.

On the other hand, **low levels of ALP**- is seen in zinc deficiency, severe malnutrition, acrodermatitis enteropathica and fulminant Wilson's disease.

3) **GAMMA GLUTARYL TRANSFERASE(GGT)**-

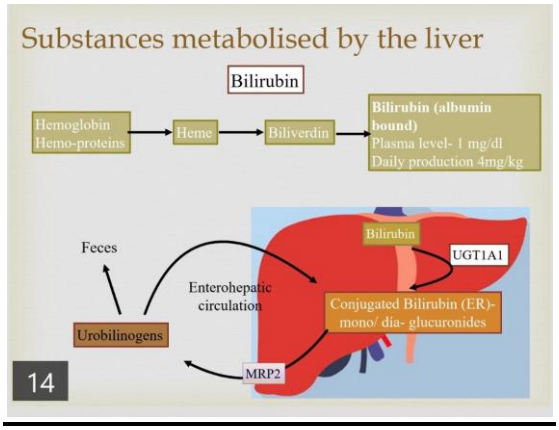
Location- cell membrane of liver, intestine, kidneys, pancreas, brain, breast. It doesn't originate from bones. Neonates and young infants have higher levels of GGT (<385 U/L) and reaches the adult level (< 75U/L) by 7 months of age.

GGT elevation- intra and extra hepatic obstruction; drugs like phenytoin, phenobarb, alcohol.

Low/Normal GGT- in PFIC(Progressive Familial Intrahepatic Cholestasis) type 1,2 and in BSAD (Bile acid synthetic defect).

As GGT does not originate from bones, it is therefore helpful in growing children to identify biliary obstruction. **Combination of both ALP and GGT is required in assessing the cholestasis in children** and hence it should be a good standard practice to insist on GGT in the LFT test to complement the ALP reading.

4) BILIRUBIN-



Bilirubin levels estimate the excretory function of the liver. Normally, direct fraction should be < 20% of total bilirubin. But, if total bilirubin is < 5 mg/dl then direct fraction > 1 mg/dl would be considered as significant.

5) ALBUMIN

It is the principal serum protein and responsible for intra vascular oncotic pressure. It is a measure of the liver's synthetic capacity as it is produced exclusively by the liver. **It has a half life of 21 days and hence a decrease in albumin is suggestive of Chronic Liver Disease.**

Before attributing low albumin level to a hepatic cause, one should exclude other causes of the same- renal, malnutrition and gastrointestinal loss.

6) PROTHROMBIN TIME/INR

PT/INR, which reflects the extrinsic pathway, is a measure of liver based coagulopathy. Factor VII, which is required in this pathway, has the shortest half life (3-6hrs) and hence a **prolonged PT/INR is suggestive of an acute synthetic failure of the liver.** Vitamin K deficiency, if responsible, will revert the PT/INR to normal within 24-48 hrs with a dose of 5 mg IV/IM.

Hence, it is mandatory to repeat a prolonged PT/INR in liver disease after vitamin K administration. Failure to improve would be ominous.

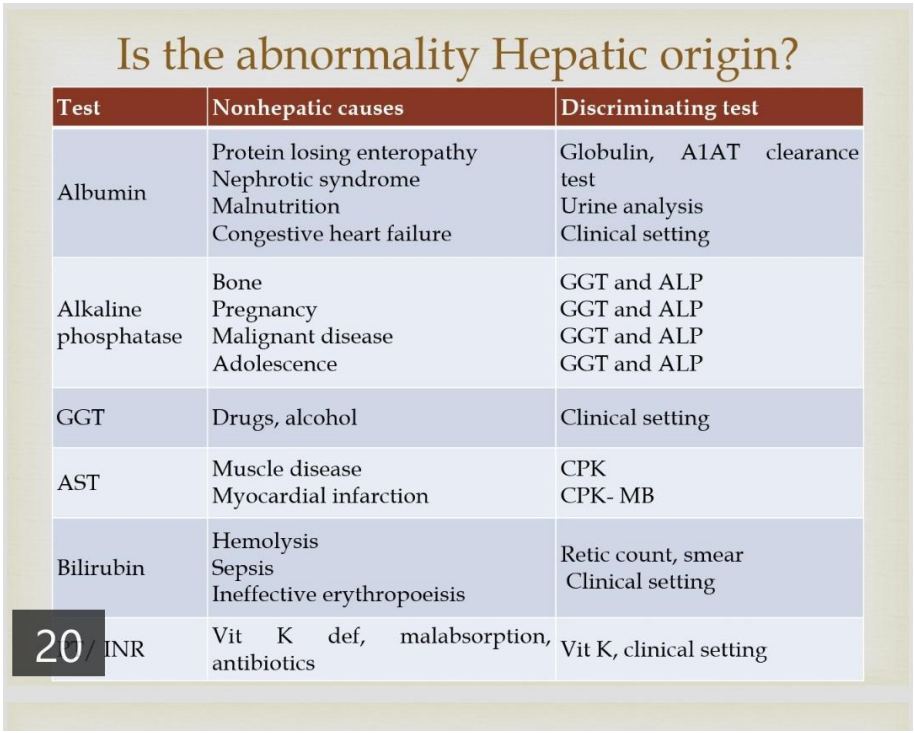
It has a prognostic value in both acute and chronic liver disease and is included in PELD/MELD/King's College criteria for liver transplant.

APPROACH TO LFT INTERPRETATION

The following issues need to be considered-

a) **Age of child and clinical scenario-** LFT must always be interpreted after a detailed history and examination and not in isolation

b) **Is the abnormality Hepatic in origin-** the various components of LFT can be deranged in extra hepatic causes as delineated in the chart below



Is the abnormality Hepatic origin?

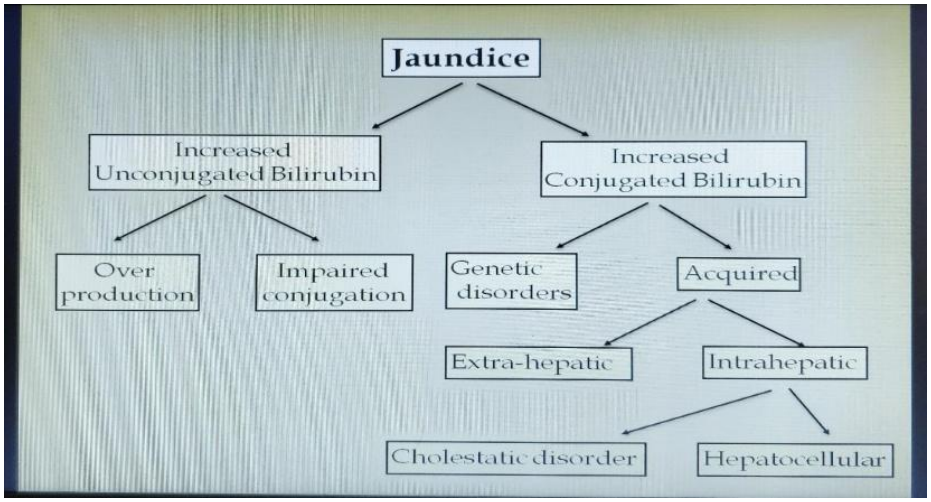
Test	Nonhepatic causes	Discriminating test
Albumin	Protein losing enteropathy Nephrotic syndrome Malnutrition Congestive heart failure	Globulin, A1AT clearance test Urine analysis Clinical setting
Alkaline phosphatase	Bone Pregnancy Malignant disease Adolescence	GGT and ALP GGT and ALP GGT and ALP GGT and ALP
GGT	Drugs, alcohol	Clinical setting
AST	Muscle disease Myocardial infarction	CPK CPK- MB
Bilirubin	Hemolysis Sepsis Ineffective erythropoeisis	Retic count, smear Clinical setting
PT/INR	Vit K def, malabsorption, antibiotics	Vit K, clinical setting

20

c) Pattern of liver dysfunction- **Hepatocellular, Cholestatic, Infiltrative**. These are the broad groups to be considered. It is important to order a complete LFT (including GGT and PT/INR) at least once to interpret results properly

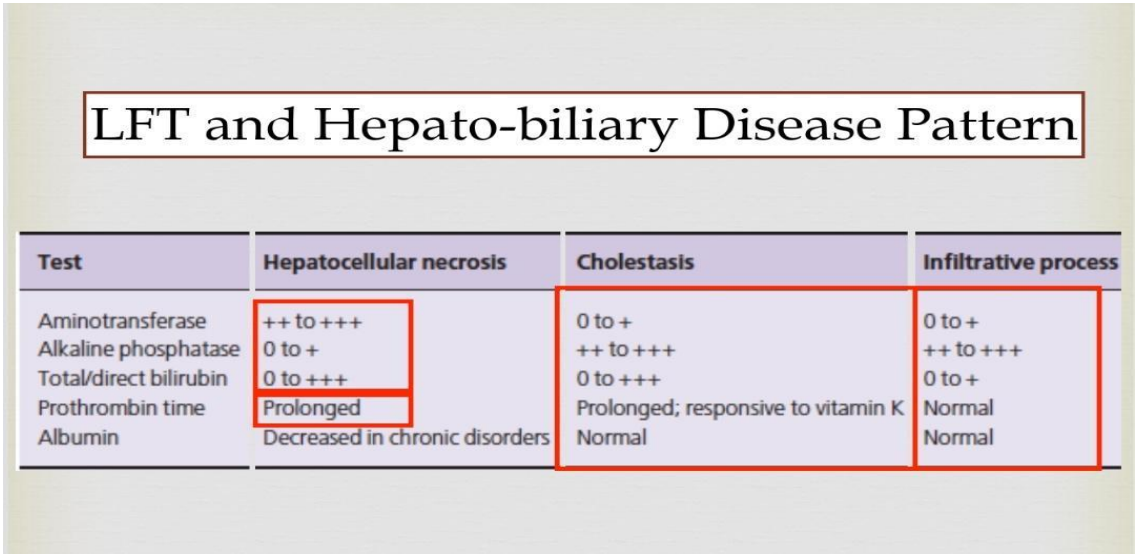
APPROACH TO JAUNDICE

In a child with jaundice, we must first establish if it is **conjugated(CJ) or unconjugated(UCJ) .** UCJ will have a clear urine. **Overproduction** would be due to hemolysis (decreased hemoglobin and increased Reticulocyte count), polycythemia, cephalhematoma. **Impaired conjugation** is seen in Crigglar Najjar, Gilbert's, BMJ.



Conjugated jaundice with other components of LFT being normal suggests genetic disorder like Dubin Johnson or Rotar syndrome. If other components of LFT are also deranged , consider cholestsatic or hepatocellular disorders, intra and extrahepatic

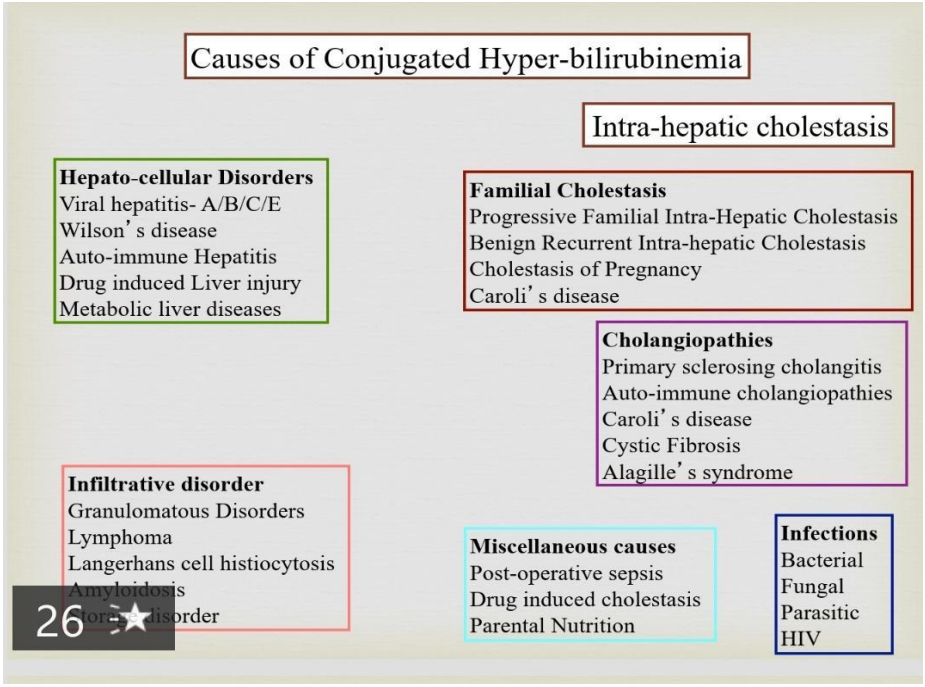
In the acquired group, it is important to clinically differentiate into 3 groups on the basis of a good history and examination. LFT interpretation will further consolidate the diagnosis.

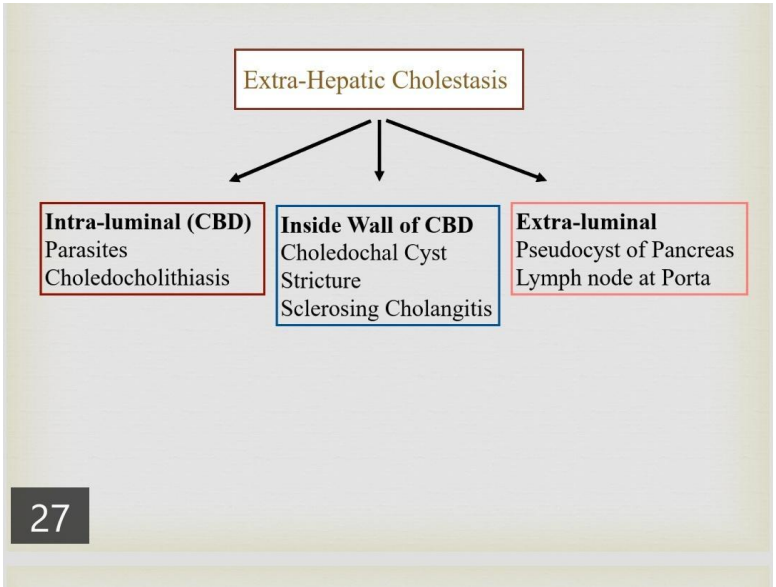


a) Hepatocellular- if we have 3 times elevation in transaminitis, normal to mildly increased ALP/GGT, and bilirubin- it suggests hepatocellular pattern. Here, normal PT is reassuring. But, elevated PT not improving with vitamin K suggests massive liver cell necrosis and liver failure. Furthermore, decreased albumin here adds a dimension of underlying chronic liver disease. The full picture would then be of an acute on chronic liver cell disease, in failure.

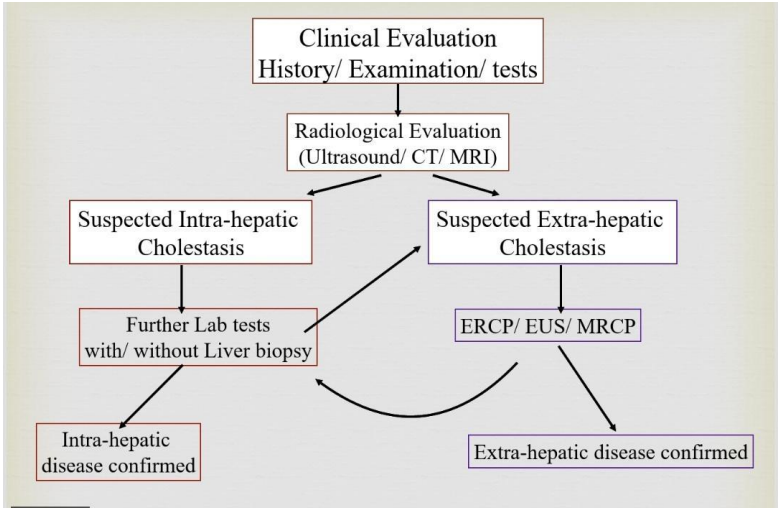
b) Cholestatic- high ALP/GGT(3X)with high direct bilirubin, with normal to mild transaminases and a prolonged PT responding to vitamin K points to cholestatic disease.
c) Infiltrative- here usually only the ALP/GGT is elevated significantly(2 or 3X), but other components are near normal, with hepatomegaly and prolonged course .

Let us now consider various etiologies based on these 3 patterns in CJ.

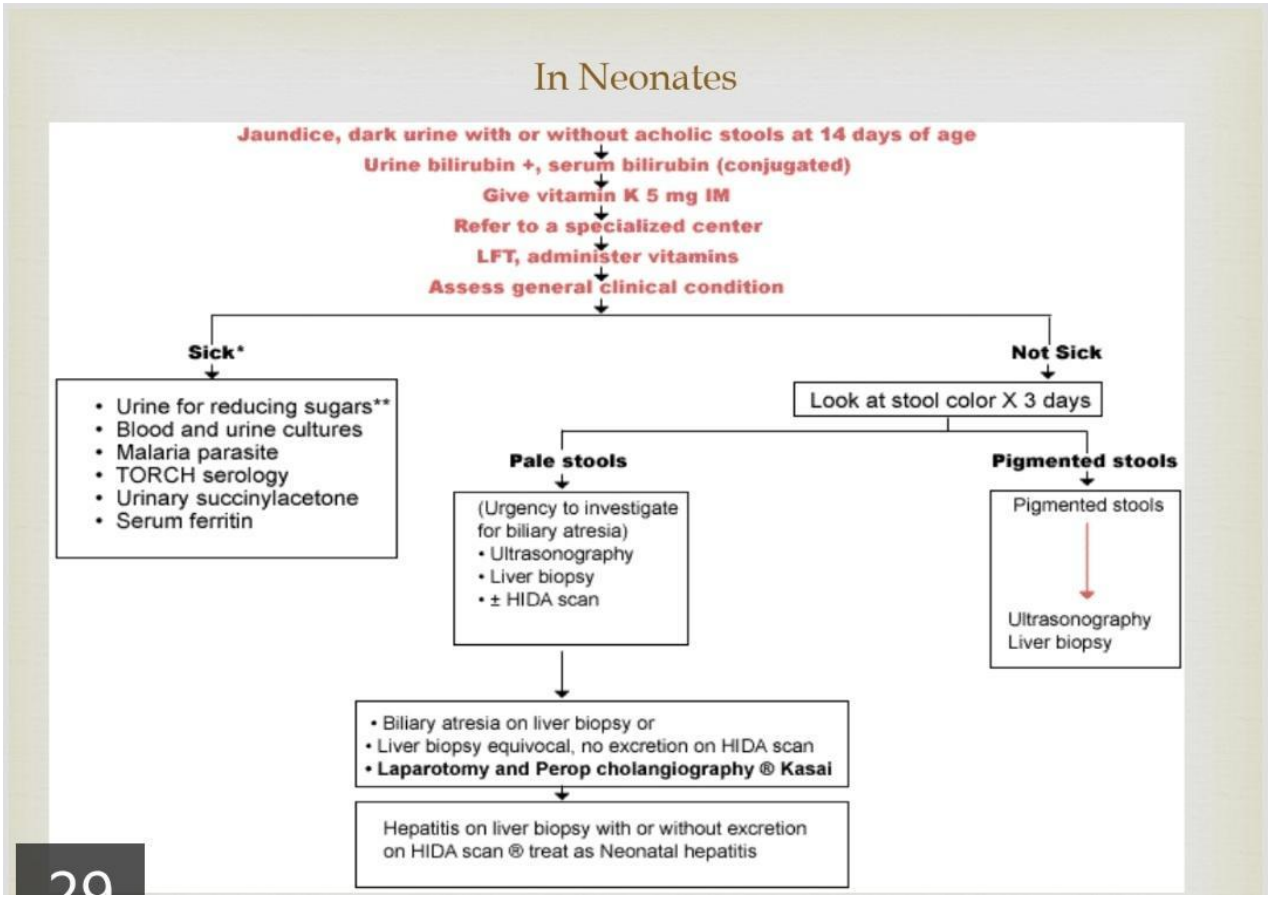




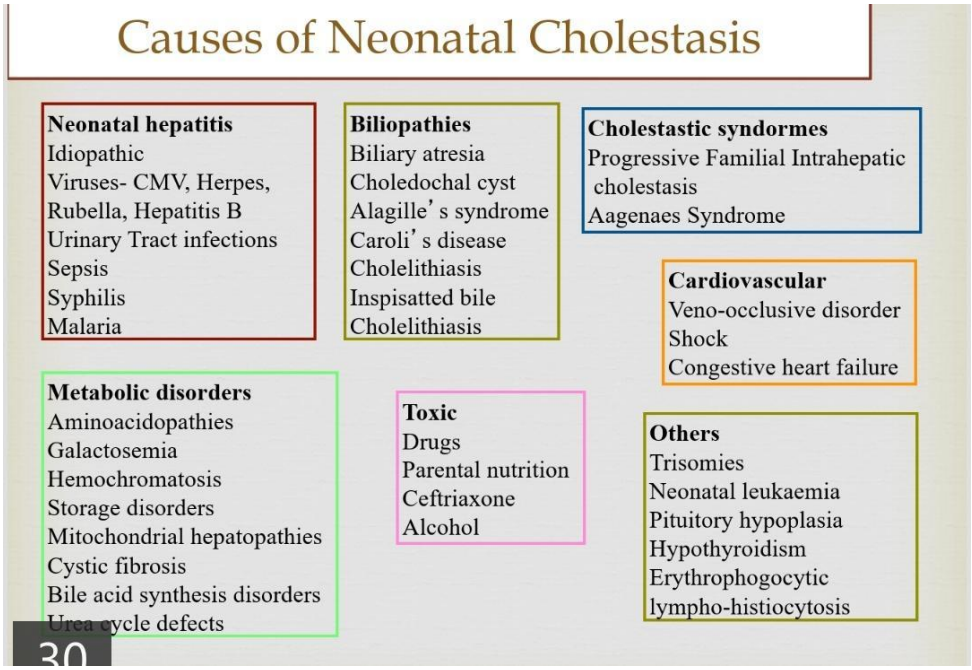
In cholestatic disorders, usually radiological evaluation is necessary depending on which other tests and/or biopsy will be required.



Neonatal cholestasis constitutes a special group where diagnosis has to be expedited to improve outcomes. Below is a simplified approach.



Various causes of neonatal cholestasis are summarized below.



In conclusion,

-LFT indicates a pattern of disease and not the etiology

-Interpret LFT in the clinical context

-Order a complete LFT(with GGT and PT) at least once

-Serial LFT is required for prognostication and a normal LFT is required to establish clearance of disease.

APPROACH TO AN ADOLESCENT PATIENT

- Dr Sushma Kirtani
- Child and Adolescent Paediatrician

As paediatricians, we are used to seeing small newborns (chintus!) to toddlers and bigger children. That is our daily bread and butter. As these kids grow and enter 10 years of age we label them teens. Earlier it was thought that teens means from 13 years of age. According to WHO – "Adolescence" extends from 10 to 19 years. This is the most fascinating period of a child's life. The period of adolescence is an eventful formative period of transition from childhood to adulthood with a unique set of developmental changes and the corresponding health care needs. Worldwide adolescents comprise about 1.2 billion i.e. 18% of total population. India has 243million about 22% of adolescent population.

The adolescent population is otherwise healthy, but common causes of mortality is mainly due to risk taking behaviour like road traffic accidents, suicides, violence, childbirth complications in teenage mothers, HIV and Tuberculosis. In India 47% of adolescent girls are underweight and 56% are anaemic. They are prone to give birth to low birth weight babies and there is high maternal, neonatal and infant mortality. The adolescents are evolving physically, psychologically and sexually to don their adult roles as responsible and free thinking individuals capable of contributing positively to the society. They are developing unique identity separately from that of the parents.

The adolescence period is divided into 3 stages: early, middle and late adolescence. Early spans from 10 to 13 years and SMR 1 / SMR 2 tanner stage. The teen has concrete thoughts, bids for independence, focused on changing body, has confused identity. There is tendency to start conflict with family and need for privacy. There is also tendency for sexual exploration.

The middle adolescence spans 14 to 17 years age group and tanner SMR stage 3 & 4. The teen has independent opinions and tendency to test the limits. There is poor impulse control. The body image issue is high. They want to separate from parents physically and psychologically. There are often peak in conflicts. Peers have a strong hold and there is more attraction towards opposite sex. They get into risk taking behaviour and sexual activity and substance abuse can be a part of the same behaviour.

The late adolescence spans 18-21 years of age and tanner stage SMR 5. The teen has independent identity and opinion and abstract thought. The actions are future oriented. The teen has a stable body image and firm perception of a unique identity. Also they re-establish "adult" relationship with parents. If the teen is in a love relationship, they are into stable relationships and sexual intimacy.

How does a Clinician handle an adolescent patient

The clinician needs to keep in mind the developmental stages of the adolescent and anticipate stage specific behavioural problems and conflicts. The developmental stresses make the teenager moody, defiant and unpredictable in their attitudes and may have difficulty to develop rapport with parents and even the doctor. Risk taking, impulsive behaviour and poor judgement are normally to be anticipated.

Adolescent friendly clinics

The teens are best evaluated in separate clinics for them. The staff, location, timings, fees and the interior of the clinic should be adolescent friendly. The doctor should have a friendly approach and needs to be non judgemental with skills to develop a rapport with the teen. Privacy and confidentiality is the core of the clinic. Confidentiality should be assured and spelt out to the teen and his parents. The teen needs to be seen in the presence of his parents and then assessed alone. If there is any relevant medical issue then permission from the adolescent is important. In India, a 12 year old can give assent or consent for an examination and an 18 year old for medical procedure including MTP. It is the duty of the doctor to build rapport and put the teen at ease right at the first meeting. The teens are not ready to see the doctor and are scared and mostly forced by their parents to see the doctor. This holds true mostly in cases of "difficult adolescent". The clinician should have good communication skills both verbal and nonverbal, eye contact, active listening, friendly demeanour, clear and appropriate language and ask open ended questions. Be supportive and encouraging all the time. The problems faced by adolescent clients can be grouped into three types:

1. Related to growth and development like delayed puberty, short-stature, anaemia, body image concerns, obesity, menstrual disorders, teenage pregnancy, suicidal ideation, substance abuse, anxiety, depression etc.

2. Childhood problems continuing into adolescence like congenital heart disease, renal, connective tissue disorders, CNS problems like epilepsy, GIT problems and respiratory issues like asthma and bronchiectasis.

3. Life styles diseases or adult onset disease like hypertension, diabetes, high lipid level etc.

How to approach the Teen Client.

The adolescent should be provided with a comprehensive health model to cover the physical, psychological and social domains, and anticipatory guidance to the teen needs to be provided all the time. 1) The history should include details of present and past medical problems. 2) Immunization history. 3) Family history of any chronic diseases. 4) Detailed Psychological history. The Psychological history is the most important and to be remembered under the mnemonic "HEEDSSS". 1. H (Home): Family members, living and sleeping arrangements, disciplining strategy of the parents. 2. E (Education): Schooling, performance in exams, pressure from parents and school, falling grades, difficulty with peer or teacher, learning disability. 3. E (Eating): Food habits, dieting, body image concerns, junk food intake, attitudes to eating etc. 4. A (Activities): Exercise, Hobbies, sports, use of media and mobile phone, bullying, fighting with peers, violence, etc. 5. D (Drugs): Use of cigarettes/alcohol, views on smoking, friends using cigarettes, whether the teens has smoked any time, will you say "NO" to a friend forcing you to smoke just one cigarette?. For use of drugs – one needs to use 'CRAFFT' questionnaire. 6. S (Suicide/Depression): ask for persistent low mood, prior suicidal thoughts, attempts of self harm in the past , any sleep or appetite problems, disinterest in activities that he/she enjoyed earlier. 7. S (Sexuality): Attitude to a sexual relationship, sexual orientation (Homo/hetero sexual) any sexual activity in the past, sexual abuse, number of partners, any STI in the past. 8. S (Safety): Driving with a license, use of seat belt, drinking and driving, sexual abuse.

The need to complete adolescent vaccination needs to be stressed especially 10 and 15 years boosters HPv-vaccines for girls, MVR shot, Hepatitis A and Hepatitis B vaccines, Typhoid and chickenpox Vaccine and a flu shot.

Anticipatory Guidance to Teenager

This is very important as health education to prevent disease and preserve good health. Adolescents need guidance on positive coping strategies and protective factors like pursuing a hobby, participation in sports and staying connected to schools and parents are to be reinforced and encouraged.

The anticipatory guidance will include: 1. Information on normal development and growth, sports participation, nutrition.. 2. Safety measures while driving. 3. How to handle peer pressure and bullying. 4. Media usage & addiction. 5. menstrual hygiene for girl 6. Life skills training. 7. Responsible sexual behavior.

CHOLEDOCHAL CYST - A CASE REPORT

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Keywords: Choledochal cyst, Bile duct cyst, Choledochocele, Hepatic cyst

Introduction

Choledochal cyst (CC) is a congenital abnormal cystic dilatation of the various ducts of biliary tree. It is more common in Asians compared to Europeans. They are classified by Todani et al on the basis of their anatomy. Anomalous pancreaticobiliary duodenal union (APBDU) is considered to be the cause of CC.

Most of them are diagnosed in children and some may go undetected till they reach adulthood. Though not seen in all cases, pain jaundice and lump form the classic triad of choledochal cyst.

If left untreated, may result in severe liver damage due to stone formation and cholangitis. Malignancy can develop in retained cyst wall.

Early surgery to remove the dilated duct along with the gall bladder and re-establishment of biliary enteric communication remains the mainstay of treatment.

We present a case of classical type 1a choledochal cyst which had nonspecific symptoms and was successfully managed in our centre.

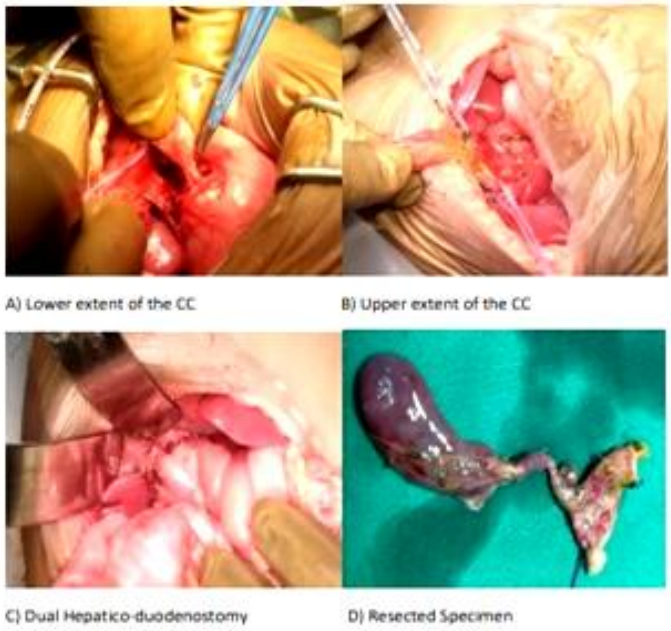
Case

A 13-month-old, first born female child of nonconsanguineous marriage presented with irritability and vomiting for 2 days. There was no fever or jaundice. she was thriving well, there was no icterus or hepatosplenomegaly. There was tenderness on deep palpation in right hypochondrium. There was no palpable lump. Rest of the systemic and general examination was unremarkable.

Hb was 9 with mild leucocytosis. LFT's and serum amylase (48 IU/L) were normal with an INR of 1. Renal parameters were normal. Ultrasound showed

cystic dilatation of common bile duct with maximum transverse diameter of 2.5 cm with a 1 cm calculus in its midportion without any IHBR (intra hepatic Biliary radicals) dilatation. MRCP confirmed the findings and it was seen to extend into both extrahepatic ducts. Liver was normal and revealed a normal signal intensity. The portal vein was normal with normal spleen. Preliminary blood cultures on admission did not grow any organism

She was started on parental antibiotics and taken up for surgery on complete evaluation. On exploration there was cystic dilatation of Common bile duct and common hepatic duct extending to both hepatic ducts. Liver was normal. There was sludge within the cyst and no obvious calculus was detected. There was no anomalous vessel or accessory biliary communication. Excision of Choledochal cyst with hepatico-duodenostomy (HD) was done. Both the ducts were anastomosed separately to the mobilised duodenum. A tube drain was left in the Morisons pouch.



Liver functions repeated on 5th post-operative day (POD) showed mild elevation of SGOT and SGPT. Feeds were started on 6th POD and gradually increased to full feeds. She had fever and leucocytosis on POD 8. Vitals were stable. Ultrasound did not show any collection. Blood culture grew Coagulase negative Staphylococcus aureus. Antibiotics were changed and she responded well. The drain was removed on 10th POD and she was discharged on 13th POD.

Biopsy of the cyst showed fibro-collagenous wall with scattered smooth muscle fibres with mild inflammation and foci of haemorrhage. The wall was lined with focal columnar epithelium. There was no granuloma or malignancy.

The lymph node showed reactive changes. Gallbladder showed hyperplastic changes in the mucosa with congested lamina propria.

The patient was well on follow up of 6 months and has been advised to follow up regularly

Discussion

Choledochal cyst is a congenital anomaly involving cystic dilatation of various ducts of biliary tree, originally described by Vater and Ezler in 1723 (1). The incidence varies from 1 in 1000 to 1 in 100000. It is more common in Asians compared to Europeans with female preponderance of 3 to 4:1 (2).

Alonzo Lej first classified them into three types which was subsequently modified by Todani and group. They classified them into 5 types (3). Type 1 is the most common and it is further divided into type Ia, Ib and Ic. Type Ia is cystic dilatation of the entire bile duct, type 1c is cystic dilatation of part of common bile duct and Type C is fusiform dilatation of the common bile duct. Type I comprises almost 90 to 95 percent of all cases of Choledochal cyst. Type II is a diverticulum of bile duct. Type III (Choledochocele) is dilatation of intraduodenal and/ or intra pancreatic part of the CBD. Type IV is combination of intra and extra hepatic biliary tree dilatation. Type V is intra hepatic dilatation limited to a segment or one or both lobes without extra hepatic dilatation. Type V associated with hepatic fibrosis is known as Caroli's disease.

The exact aetiology of Choledochal cyst is not known. However, the most acceptable theory is that it is caused due to abnormal pancreaticobiliary duodenal union (APBDU) (1). This results in reflux of mixture of bile and pancreatic juice into biliary tree causing damage and inflammation to its wall. The potential weakness created results in abnormal dilatation and stasis of bile. Stasis causes inflammation, biliary sludge and calculi formation and in some cases metaplastic changes leading to malignancy.

The presentation is broadly classified into two types (3). The infantile type, that is diagnosed in the first year of life and the adult type, that is diagnosed any time after one year. About 20 % of patients are diagnosed in utero on antenatal sonography, 60 % in Children and 20% in adults beyond 18 years. The presentation varies depending on the age and the associated complications. The classical presentation is a triad of pain, jaundice and lump. However only few patients have classical presentation. Those presenting in infancy usually

have jaundice, acholic stools and hepatomegaly and usually present in first few months of life. They may represent a correctable type of biliary atresia. The later ones present with cholangitis and may have two or all three features of triad. There are three reported cases of women who presented with complications of choledochal cyst during their pregnancy. Two of them succumbed to the complications. (4)

Ultrasonography (USG) is a useful screening and diagnostic tool for detection of Choledochal cyst. Magnetic Resonance Cholangio Pancreatography (MRCP) gives detailed anatomical delineation (5). CT is useful in differential diagnosis of intra hepatic cysts. USG and MRCP have replaced the traditional invasive investigations like Percutaneous Transhepatic cholangiography (PTC) or Endoscopic Retrograde Cholangio Pancreatography (ERCP). In certain cases, however (type III), ERCP is preferred as it can be of therapeutic use. Intraoperative cholangiogram is used only to delineate the lower duct anatomy if not clear on MRCP.

If left untreated, there is risk of complications like cholangitis, stone formation, pancreatitis and malignancy. Previously they were managed by external or internal drainage. There was high morbidity in the externally drained group and hence given up. Internal drainage also resulted in high incidence of complication similar to untreated group. The risk of malignancy varies from 6 to 30 percent and even in those who are adequately treated the risk is about 4 percent. Outcome is very poor in those who develop malignancy (6). Hence complete excision of the cyst with re-establishment of biliary enteric communication is considered the gold standard treatment of type I and IV Cysts. This may be done by open laparotomy or by minimal invasive technique (7) including Robotic surgery (8). In difficult cases due to recurrent cholangitis, posterior wall is stripped of the inner lining and outer wall is left behind and rest of the cyst completely excised as described by Lilly to safeguard the adherent portal vein and hepatic artery (3). Thorough knowledge of variation in the anatomy is necessary during the excision. (9)

The reestablishment of Biliary enteric communication is done by a Roux-en-Y hepaticojejunostomy (HJ) or a direct hepatico duodenostomy (HD). Results of both are equally good (3). In our experience HJ is safer but takes more intra operative time and more likely to predispose to intestinal obstruction. HD is more physiological and allows easy accessto the biliary tree endoscopically in future if necessary. In type IV the intra hepatic dilatation resolves in majority of cases. However, in some cases it may persist causing stone formation and recurrent episodes of cholangitis. Hence, they need very careful follow up.

Anastomotic stricture can also result in IHBR dilatation predisposing to complications. All patients need lifelong observation.

Type II requires simple excision of the diverticulum and can be easily performed laparoscopically. Type III are managed by internal decompression into the duodenum endoscopically. Some of these may even have to undergo Whipple's Surgery. Type V requires a segmentectomy, lobectomy or sometimes hepatectomy with Liver transplantation. (10)

Conclusion

Choledochal cyst though not very common requires high degree of suspicion. Ultrasound (USG) and MRCP have replaced the more invasive investigations like PTC and ERCP. Early surgery is recommended in all cases including the asymptomatic ones. Complete excision with reestablishment of biliary enteric communication is the treatment of choice in type I and IV. Laparoscopic excision is increasingly used nowadays. The choice depends on the experience and expertise of the surgeon. We prefer duodenum over jejunum to re-establish biliary enteric communication. Long term follows up is mandatory in all operated cases.

References

1) Kevin C Soares 1, Seth D Goldstein 2, Mounes A Ghaseb 3, Ihab Kamel 3, David J Hackam 2, Timothy M Pawlik 4; Pediatric Choledochal Cysts: Diagnosis and Current Management: Pediatr Surg International: 2017 Jun;33(6):637-650.

2) Baison GN, Bonds MM, Helton WS, Kozarek RA. Choledochal cysts: Similarities and differences between Asian and Western countries: World J Gastroenterol. 2019 Jul 14;25(26):3334-3343.

3) Arnold G Coran, N Scott Adzick, Thomas Krummel; Pediatric Surgery, seventh edition 2012, Elsevier Saunders Pg 1332, 1334 and 1336.

4) Martínez-Ordaz JL, Morales-Camacho MY, Centellas-Hinojosa S, Román-Ramírez E, Romero-Hernández T, de la Fuente-Lira M. Choledochal cyst during pregnancy. Report of 3 cases and a literature review; Cir Cir. 2016 Mar-Apr;84(2):144-53. doi: 10.1016/j.circir.2015.06.017. Epub 2015 Oct 21.

5) Anglade E, Aubé C, Lebigot J, Croquet V, Loisel D, Coupris L, Caron C.; Preoperative evaluation of choledochal cyst with MR cholangiopancreatography; Arch Pediatr. 2000 Jan;7(1):49-53.

6) Madadi-Sanjani O, Wirth TC, Kuebler JF, Petersen C, Ure BM.; Choledochal Cyst and Malignancy: A Plea for Lifelong Follow-Up.; Eur J Pediatr Surg. 2019 Apr;29(2):143-149.

7) Tang ST, Yang Y, Wang Y, Mao YZ, Li SW, Tong QS, Cao GQ, Zhao ZX.;Laparoscopic choledochal cyst excision, hepaticojejunostomy, and extracorporeal Roux-en-Y anastomosis: a technical skill and intermediate-term report in 62 cases.Surg Endosc. 2011 Feb;25(2):416-22.

8) Ko JW, Choi SH, Kwon SW, Ko KH.; Robot-assisted hepatectomy and complete excision of the extrahepatic bile duct for type IV-A choledochal cysts.; Surg Endosc. 2016 Dec;30(12):5626-5627.

9) Varun Hathiramani, Janani Krishnan, Vinod Raj, and Rajeev G. Redkar; Choledochal cyst with an aberrant right cholecysto-hepatic duct draining into cystic duct and a review of literature; J Indian Assoc Pediatr Surg. 2016 Oct-Dec; 21(4): 205.

10) Shi LB, Peng SY, Meng XK, Peng CH, Liu YB, Chen XP, Ji ZL, Yang DT, Chen HR; Diagnosis and treatment of congenital choledochal cyst: 20 years' experience in China.World J Gastroenterol. 2001 Oct;7(5):732-4.

MAPLE SYRUP URINE DISEASE: A CASE-BASED DISCUSSION

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Introduction

Maple Syrup Urine Disease (MSUD) is a relatively uncommon disorder and may be challenging to diagnose and manage as the presentation is often non-specific and therapeutic options are considerably restricted. This case-based discussion aims to highlight the management of a child with MSUD from suspicion and diagnosis to acute and long-term management.

Case report

A 3-month-old baby was referred with vomiting on and off since 7 days without any relief after antiemetics. Clinical examination in the first two days was unremarkable. On day 7, he was brought because he was unable to feed and had fast breathing and lethargy. When seen by the pediatrician, he was obtunded, appeared dehydrated and had tachycardia, feeble pulses and tachypnea with SpO_2 of 85% in air. His chest was clear, work of breathing was normal, pupils were reacting equally, and he had momentary response to painful stimulus. RBSL was normal. He had a soft liver palpable 4 cm below the costal margin. There were no obvious external injuries. On probing, there was no history of fever, diarrhoea or cough. No home remedies or self-medication were used and there was no suspicion of foul play. Birth history was uneventful, and the baby had been thriving well so far.

What is the assessment?

This baby has shock, respiratory distress and encephalopathy the cause of which is not clear yet. Such a picture can occur in severe dehydration, hypovolemic shock, sepsis or severe metabolic acidosis.

The baby appears too sick for the expected degree of dehydration from intermittent vomiting alone. Though there was no fever, sepsis is a possibility

which cannot be ruled out till initial investigations are reviewed and the clinical picture evolves. At present, our aim would be to stabilise the baby's physiology and prevent further deterioration.

Case progresses

He was started on supplemental oxygen, intravenous access was obtained, blood samples were collected, normal saline bolus started, and the transport team was called. Once the circulation improved, a second IV line was secured, a blood culture was taken, and a dose of ceftriaxone was administered empirically. Arterial blood gas showed severe metabolic acidosis (pH 6.9, pCO_2 19, pO_2 78, HCO3 5.0, BE – 25) with an anion gap of 30. Blood counts, CRP, electrolytes, renal function were normal.

Discussion

High anion gap metabolic acidosis can occur due to several reasons (sepsis, uremia, diabetic ketoacidosis, various drugs, IEMs, lactic acidosis, ethanol/methanol intoxication) but in this context, an IEM or lactic acidosis appears most likely. The commonly encountered IEMs which present in such a manner are organic acidemias, fatty acid oxidation defects and urea cycle defects. At this point it may be impossible to identify the specific disorder and further testing is necessary. However, the initial management of acute decompensation is essentially similar in all IEMs and a specific diagnosis is rarely required to being therapy.

Sepsis, wherein the acidosis is generally not so severe, is less likely. However, in the presence of shock, it is extremely crucial to administer the first dose of antibiotics as soon as possible, ideally within one hour of recognition: this has a direct bearing on the chances of survival.

This baby is likely to require multi-modal monitoring, frequent blood investigations, advanced venous access and possibly mechanical ventilation and therefore needs to be transferred to PICU.

Case progresses

While awaiting the PICU team, 10% dextrose was started as a maintenance fluid and an infusion of sodium bicarbonate was administered. When the PICU team arrived, the baby had received 20 ml/kg of normal saline as boluses but continued to have tachypnea and tachycardia but with pulses well palpable. His neurology had not changed, and the liver was 4 cm below the costal margin.

He was briefly connected to a non-rebreathing mask, a 10 ml/kg normal saline bolus was repeated and he was intubated after induction with ketamine and

rocuronium. He was transported by ambulance to the PICU. Maintenance fluids and bicarbonate infusion were continued en route.

In PICU he was ventilated on SIMV/ PC with a PEEP of 5 and a Tidal volume target of 6 ml/kg. Internal jugular central venous access was obtained. Serum ammonia, lactate, coagulation profile, serum ketones and urine ketones were sent. A blood sample was collected on filter paper for tandem mass spectrometry (TMS) for IEM. Plasma and urine samples were stored for amino acid assays and organic acid screen, respectively.

Maintenance fluids (10% dextrose in 0.45% saline) were started 150 ml/kg/day. A low dose intralipid infusion was started. The bicarbonate infusion was continued. Metabolic supplements- thiamine, B12, biotin, carnitine, oral sodium benzoate and oral L-arginine were started. A low dose insulin infusion was started when he developed hyperglycemia.

Discussion

In the management of critically ill children, key interventions may be started even before the baby arrives in PICU. In countries which follow the hub-and-spoke model of healthcare, certain crucial interventions are started in referring hospitals often on telephonic consultation, well before even the arrival of the transport team. In our case, early initiation of simple interventions like maintenance fluids and sodium bicarbonate infusion was vital.

This child was intubated primarily due to respiratory distress (with which he would eventually tire out) and encephalopathy (which often threatens airway safety). Secondly, interventions such as central venous access become easier in a ventilated infant as sedation and paralysis can be used safely.

Once the physiological derangements have been stabilised (hemodynamics, respiration, airway patency and protection) it is important to begin the diagnostic workup. Blood glucose, ketones, arterial/ venous blood gas, ammonia and lactate give a fair insight into the type of disorder one is dealing with.

A definitive diagnosis is made on the basis of TMS and urine organic acid screen. However, these tests have a turn around time of at least 48 hours. Till then empirical therapy needs to be started. This includes withholding feeds (no protein intake); maintenance fluids much above the normal requirement with a high glucose delivery rate, sometimes with a low dose of intralipid and insulin (in order to stop endogenous protein catabolism); sodium bicarbonate infusion to control the acidosis; specific metabolic supplements while the actual disorder is not yet known.

Case continues

Serum ammonia was 53 mcg/dL, lactate was 1.5 mmol/L and urine ketones were 2+. Based on this, an organic acidemia was considered likely. Complete blood counts showed Hb 8.9 g/dL, WBC 7800, N 65, L 30, M 05, platelets 3.4 lakhs; CRP was negative. Chest X Ray and lung ultrasound were normal. Echocardiography showed a structurally normal heart with good biventricular contractility. Abdominal ultrasound was normal.

Over the next 48 hours, his acidosis improved and the sodium bicarbonate was tapered and stopped. His level of consciousness and respiratory distress began to improve and he was extubated after 72 hours of ventilation. Blood and urine culture were sterile and antibiotics were stopped.

However, 24 hours later his level of consciousness worsened once again and the tachypnea reappeared. A blood gas and serum ammonia were repeated.

Discussion

Organic acidemias are metabolic disorders wherein the function of a single enzyme in the catabolic pathways of specific amino acids is impaired resulting in the accumulation of ketone bodies in blood. These ketone bodies cause encephalopathy and contribute to the typical high anion gap metabolic acidosis. The encephalopathy is also partly due to high ammonia which is a medical emergency is associated with adverse outcomes if not managed promptly and aggressively. Most disorders occur due to a single gene defect. Depending on the severity of enzyme deficiency a child may present within the first week of life or sometimes several months or years later. Milder forms may present with only intermittent crises often triggered by a stressor such as fasting, dehydration, fever or an acute illness while being completely well in between.

In a crisis, clinical improvement is expected once the catabolism stops which is typically 48- 72 hours. Worsening after apparent improvement suggests either premature withdrawal of therapy or a new complication.

Case continues

The blood gas showed respiratory alkalosis (pH 7.52, pCO2 24, pO2 62, HCO3 28, BE + 4.0) and the serum ammonia was 190 mmol/L. 24 hours later, the ammonia was 330 mmol/L despite the ongoing medical management. As continuous replacement therapy (CRRT) was not available, peritoneal dialysis was started.

Discussion

Hyperammonemia is a medical emergency. High serum levels can cause profound and permanent neurological damage. Medical management is recommended for serum levels above 200 mmol/L. This includes IV sodium benzoate, IV phenyl butyrate, L -arginine and carglumic acid. Of these, only oral sodium benzoate and oral L-arginine are available in India. When levels are above 500 mmol/L or above 200 mmol/L and rising rapidly despite therapy, dialysis or renal replacement therapy (RRT) needs to be started promptly. Hemodialysis is very effective but is poorly tolerated by young infants who are extremely prone to develop hemodynamic instability. Continuous renal replacement therapy (CRRT) is the modality of choice in this situation but requires a dedicated machine, often unavailable at several centres in India. Peritoneal dialysis though less effective and not recommended as a standard of care, may be used in the absence of other alternatives.

Case continues

The serum ammonia began to fall within 12 hours of starting peritoneal dialysis. By 72 hours it was below 100 mmol/L and the PD was stopped. TMS screening showed high levels of valine, leucine and isoleucine. Urine organic acid panel showed elevated levels of urinary ketones (2-hydroxy butyric acid, 2-hydroxy isovaleric acid, 3- hydroxy butyric acid, 3-methyl 2-hydroxy valeric acid, lactic acid). This profile was suggestive of Maple Syrup Urine Disease. The child was started on corn starch-based feeds and switched to a disorder specific formula once available. A low protein, high calorie diet was planned. The child was discharged after 10 days of hospitalisation.

Discussion

MSUD though a rare disease (worldwide incidence 1:185,000) is among the more common organic acidemias. It is caused by a mutation in the BCKDHA, BCKDHB and DBT genes which encode for subunits of the enzyme branched-chain alpha-ketoacid dehydrogenase complex. Based on the severity of enzyme deficiency four clinical variants are described: (1) classic MSUD (which presents in the early neonatal period); (2) intermediate (presenting in infancy or early childhood); (3) intermittent (crises triggered only when in stress) and (4) thiamine responsive MSUD. Genetic analysis and prenatal diagnosis are available.

The case we discussed appears to be either intermediate or intermittent type. Once out of crisis, dietary modification and protein restriction are vital to prevent crisis. Branched-chain amino acids (BCAAs) are essential amino acids

and cannot be completely withdrawn from the diet. Such dietary changes are therefore extremely difficult to achieve from a home-based diet in a young infant and a pre-made modified dietary formula (with restricted branched-chain amino acid source) becomes essential at least in the first 2 years of life. For long, such formulae were not manufactured in India and were cost prohibitive. Only recently, these are being manufactured in India and are far more affordable. Serial monitoring of plasma branched-chain amino acid levels is performed in various centres globally as a marker of effective BCAA restriction. Liver transplant is considered as a therapeutic option after children are known to tolerate a normal diet.

Follow up

Over the next 6 months since diagnosis, the child had no further crises. He showed steady growth within centiles and had achieved normal age appropriate milestones. Soft hepatomegaly was noted to be present persistently.

Conclusion

Maple Syrup Urine Disease is an uncommon disease but carries a fair prognosis. The presentation may be highly non-specific but predominantly involves acute neurological derangement- in the absence of pointers of sepsis- and supported by typical metabolic derangements. It is neither possible nor essential to make a specific diagnosis to start treatment and initial therapy of all IEMs is essentially similar. A high index of suspicion and aggressive management of metabolic derangements especially hyperammonemia is necessary for optimal outcomes. Acute care as well as long term therapeutic modalities are now available in India.

ACTIVITIES

Activities by Sethu

The new year 2020 started off with a lot of enthusiasm and hope for smooth sailing at Sethu. The Covid pandemic crisis hit all of us with a vengeance. However, our bridge still stands strong! Despite the challenges, the Sethu Team has had quite an active time through the assessment and therapy services and our training programs.

1. Clinical services: The high rate of referral remained steady through the first two months of the year. To streamline the process of assessment and therapy, the Sethu team has been working hard to develop Standard Operating Procedures (SOPs) for the common conditions that we see, as well as the therapeutic programs. For example, in the medical treatment for ADHD, we have very well-developed protocols on how medication should be started, evaluated, increased and monitored. The process is accompanied with the use of checklists to assess parent and teacher feedback too. In March, the lockdown severely affected Sethu's outreach and we had to close the doors of the centre for the first time in its 15-year history. However, we rallied to the occasion by going online and developing a protocol for teletherapy and supportive care via various modalities like Google Hangouts, WhatsApp, email and phone calls.

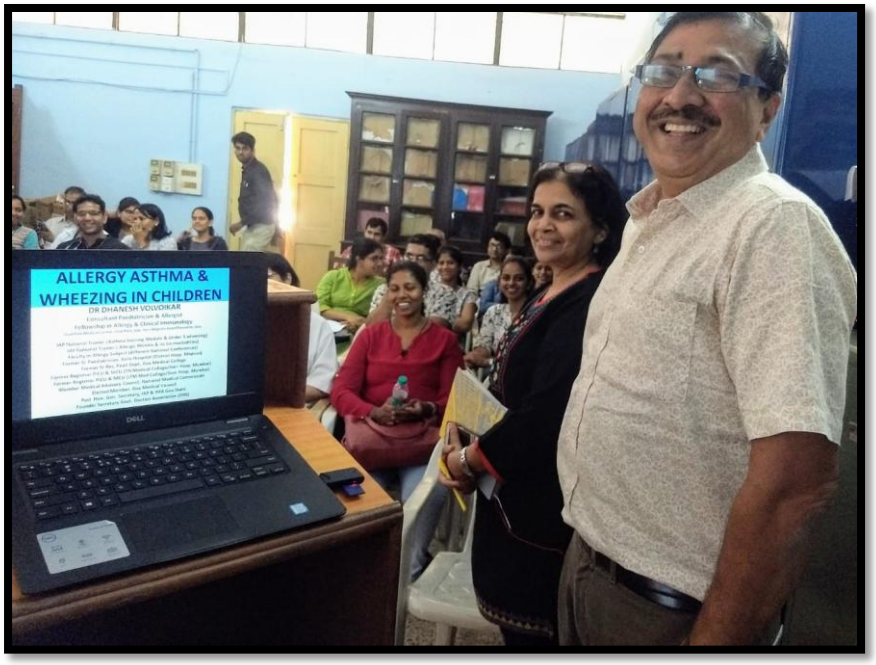
2. Training programs: With an onslaught of face to face programs at the start of the year, including workshops for teachers on topics like understanding autism, ADHD, inclusive education and learning disabilities, the Sethu team moved seamlessly into conducting webinars. The focus on Comprehensive Sexuality Education (CSE) continued with a workshop for teachers of Regina Mundi School, as well as the parents of the preschool section. Dr. Vikram Dua, a child and adolescent psychiatrist from Canada spoke to Sethu parents on medication for ADHD, as well as conducted a session for the pediatricians and psychiatrist of Goa Medical College on a rational approach to treatment of complexities in autism.

3. International Collaborations: Seven members of Team Sethu attended the 3-day workshop in Hyderabad, organized by the Indo-Canadian Autism Network

(I-CAN) under the auspices of Fernandez Child Development Centre. It was a learning fest, as the resource persons had many years of experience in the various aspects of autism such as diagnosis using the ADOS-2, rational psychopharmacology of complex cases, enhancing learning and behavior, as well as promotion of social communication in infants with autism. Sethu plans to take this forward by developing new protocols for working collaboratively with children with autism and their parents.

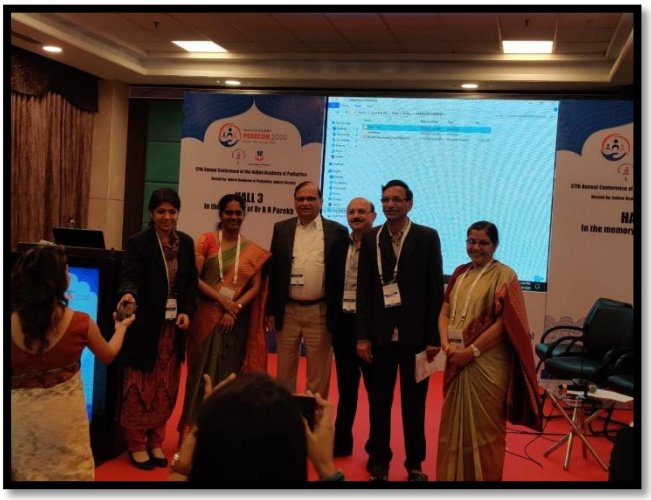
Sethu is all geared to meet the challenge of Covid Times in the days ahead and wishes all the pediatricians of Goa an abundance of health and safety in the long months ahead.

Dr Dhanesh Volvoikar did a presentation on " **ALLERGY, ASTHMA and WHEEZING IN CHILDREN"** ON **22ND January 2020** at a CME programme at Hospicio Hospital, Margao. The presentation was very informative and interesting and was well attended by a number of 50+ doctors which included consultants, medical officers and staff nurses.



Goa State Chapter representation at **the National Pedicon** held at Indore from the **9th to 12th of January 2020**.

Dr Harshad Kamat as **panellist** for a panel discussion on '**Nutritional anaemia'**



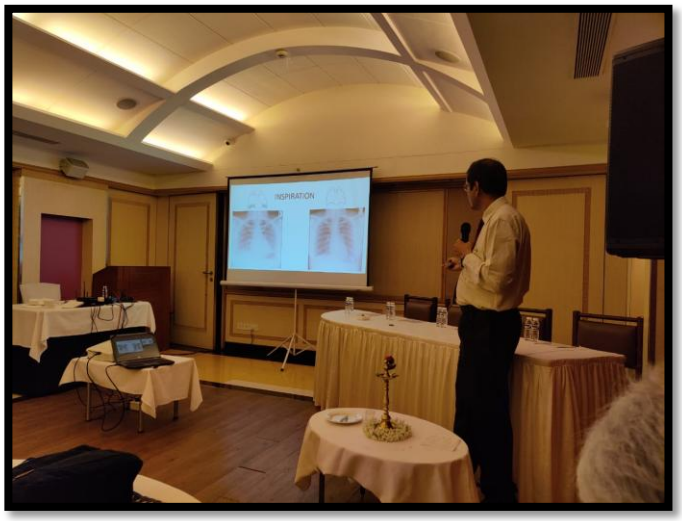
Dr Divya Saraswat participated in the **12th NRP NATIONAL 'TRAINING OF TRAINERS WORKSHOP'** held on **7th and 8th January 2020** at **Indore**

Goa IAP members receiving the many **prizes** for the **IAP Goa state branch** at the National Pedicon 2020 held at Indore

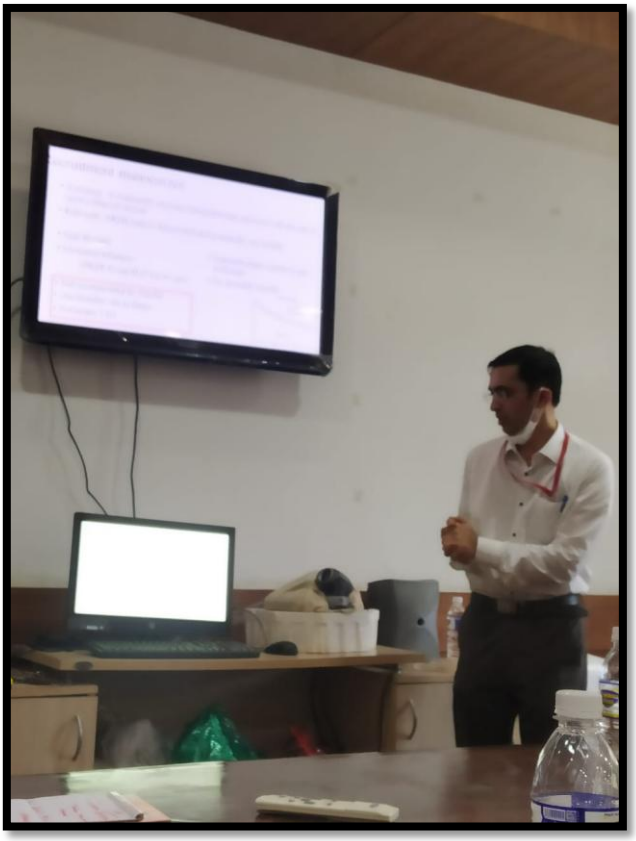
Indian Academy of Paediatrics, Goa State Chapter organised the **TRAC** (Test, Result And Clues) Module on the **9th of February 2020**

The scientific session consisted of the following topics

- **ABC of CBC by Dr Ratna Sharma**
- **LFTs by Dr Harshad Kamat**
- **Urine Analysis and RFTs by Dr Pankaj Deshpande**
- **Interpretation of X-rays by Dr Mahesh Mohite**
- **Infanrix Hexa Vaccine**



Dr. Sumant Prabhudesai was the resource person for the topic " **Ventilation and ARDS Management in Paediatric patients**" for 2 day CME on "**Comprehensive Care in Covid 19**" held on 20th and 21st of April 2020 at ESI COVID Hospital. The CME was attended by Medical Officers, Paediatricians, Anaesthetists, Surgeons , Physicians(from ESI, Hospicio and Goa Medical College).



The Pediatric alumni meet "**GOMECO PALS 2020**" (brainchild of Dr.Mimi Silveira) was held on the **2nd of February 2020** at the Goa International Centre, Dona Paula.

The glittering function began at 4:30 pm with high tea being served to all the alumni as they arrived and began exchanging warm hugs, remembering the good old times!

The formal function followed with a welcome dance by a GMC pediatric dept. Senior resident Dr.Rashi Agrawal. Dr.Vaishali Joshi, associate professor, then formally welcomed the august gathering. The ex-HOD's Dr.Laxmi Gaunekar and Dr.Philomena D'Souza, were then felicitated at the hands of Dr.Pradeep Borkar and Dr.Fernando Mascarenhas.

The pediatric dept. then had a little surprise for Dr.Mimi and felicitated her at the hands of Dr.Laxmi and Dr.Philomena... Dr.Mimi, who has witnessed the growth of this department right from its fetal stages to its current status, outlined the progress the department had made over the years.

The alumni directory, which is a compilation of details of Pediatric residents who have walked through the portals of Goa Medical College since its inception, was then released.

The formal function ended with all the current faculty and residents of the department of Pediatrics rendering a heartfelt song "I have a dream"...

The formal function was compered by Dr.Lorraine D'Sa, who then handed over the mike to Dr.Deepa Correia Afonso and Dr.Nandita De Souza for a great round of games over snacks and drinks, along with handing out amazing spot prizes!...

Mr. Pierre Fernandes entertained everyone with his music and many alumni managed to shake a leg at the stage...

Not to be left behind, the junior residents also had a surprise cake for Dr.Mimi, to commemorate her 40 illustrious years in the department, along with a toast raised by Dr.Rashi and a special song composed by Dr.Nandita De Souza in her honour...

There was a special photo booth and a family tree of the department made by Dr.Prasad Sawant where many alumni took pictures to take back home fond memories... There was also a batch wise/ year wise photo session!

The function ended with a sumptuous buffet and everyone left with a warm feeling in their heart, armed with a copy of the alumni directory, fond memories and a beautiful memento of the Escola Medica Cirurgica de Goa...


THE
INTERNATIONAL
CENTRE
GOA


1999


Dr. Lorraine Costa Fernandes
Dr. Rochelle Caeiro
Dr. Poonam Patil Sambhaji
2005
Dr. Tirunavakkarsu
Dr. Suvarna Naik
Dr. Prachi Lawande


Shot on OnePlus
By Dr. Kritika Kamat


GOMECO PALS 2020
"ALL U(M)NITED"
Escola Médico-Cirúrgica de Goa
1842-2020

1) A 2.5 yr old child presented with signs of new onset nail dystrophy, loosening of teeth and a cystic lesion of the scalp. He was started on ATT for the nodular opacities in the chest however there was poor response in spite of good adherence. Most likely diagnosis is
A) MDR TB
B) Disseminated fungal infections with PID
C) Langerhans Cell Histiocytosis
D) Yellow Nail Syndrome

2) **A** 5 year old girl from rural Bihar k/c/o beta thallesemia on regular follow up and intermittent blood transfusion presented with high grade fever with severe pallor with significant leucopenia. Most likely diagnosis

3) EXPAND THE FOLLOWING

A) PHACES
B) NESTROFT
C) CHARGE
D) PAPPA

4) A 6 yr old boy is brought to clinic because of pain in the right knee since the past 2 days. He walks with a limp. No h/o trauma. Had a cold a week back. Vital signs are normal. Physical examination shows full range of knee movements however internal rotation of the hip joint is restricted. Labs- ESR mildly elevated with a normal WBC. AP view and Frog leg xray studies of the right hip and knee are normal. Most likely diagnosis
A) Developmental dysplasia of the hip
B) Legg-Calve-Perthes disease
C) Septic joint
D) Slipped capital femoral epiphysis
E) Transient synovitis

5) A 2 yr old girl is brought to the OPD by her parents after blood was noticed in her urine. The parents say that the patient had intermittent abdominal pain in the past 2 months. . On physical examination there is mild abdominal distension and a palpable mass in the right upper quadrant. Urine analysis shows positive results for blood and protein. Which of the following is the most likely diagnosis?
A) Cystic nephroma
B) Cystitis
C) Mesoblastic nephroma
D) Neuroblastoma
E) Wilms tumor

6) A 16 year old girl is brought to the office for follow up regarding recently diagnosed polycystic ovarian syndrome. The patient was initially examined because of hirsutism, amenorrhoea and virilisation. These findings are most likely due to the effect of which of the following agents?
a) Estrogen
b) Follicle stimulating hormone
c) Luteinizing hormone
d) Testosterone
e) Thyroid stimulating hormone

7) A 16 year old boy is brought to the office because he has decreasing school performance over the past 6 months. During this time the patient has become more irritable and irresponsible, has changed his group of friends and has had decreasing personal hygiene. He was previously a

high achieving student but his grades have slipped to the extent that he is failing several courses. Which of the following disorders is the most likely cause of the patient's symptoms?

a) Bipolar disorder
b) Conduct disorder
c) Major depressive disorder
d) Persistent depressive(dysthymic) disorder
e) Substance use (substance abuse)

8) A 4 year old girl is brought to the office by her parents for well child examination. The parents say the patient has been healthy, but that she tires more quickly than her peers while they are playing. She is on the 10^{th} percentile for height and the 40^{th} percentile for weight. Blood pressure is 132/82mmHg in the left arm and 128/80 mmHg in the right arm. Repeat measurements are in the same range. Which of the following is the most appropriate next step?

a) Counsel parents regarding diet and disease
b) Measure blood pressure in lower extremities
c) Order urinanalysis
d) Recheck blood pressure in two weeks
e) Refer the patient to a nephrologist

9) A 2 day old boy manifests with poor feeding, vomiting and lethargy leading to coma. Laboratory data reveal respiratory alkalosis and hyperammonemia. The urine orotic acid level is also elevated. The most likely diagnosis is

a) Methyl malonic academia
b) Carbamoylphosphate synthase deficiency
c) Ornithinetranscarbamylase(OTC) deficiency
d) Galactosemia
e) Reye Syndrome

10) Initial laboratory studies to investigate for metabolic disease in an ill infant should include:

a) Lactate, glucose, bicarbonate
b) Glucose, calcium, pH
c) Na, glucose, bicarbonate
d) pH, Bicarbonate, Ammonia

Kindly mail your answers to **dr.celineandrade@gmail.com**