The Child and Newborn

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Role of Communication in Effective Vaccination

Other than safe drinking water childhood immunization is the most effective health intervention towards controlling the spread of communicable diseases. Vaccinations in children save nearly 3 million lives every year.

Despite the successful eradication of smallpox, close to ending polio and decrease in measles deaths by 78%, worldwide nearly 1 in 10 infants do not receive any vaccines. An estimated 10 million additional infants must be vaccinated if all countries are to achieve 90% coverage. But the target of 90% coverage is not beyond reach. It is imperative that immunization programs face challenges that contribute to low and stagnant coverage.

Raison d'être

The challenges in health system are there in all areas. The challenges are in policy, governance, finance, steady vaccine supply, human resources, logistics, implementation, monitoring and above all communication.

Role of interpersonal communication in routine immunization

Interpersonal communication (IPC) is a process of sharing of information, ideas and feelings between two or more people. It is imperative that communication is two-way mechanism. It includes both verbal and non-verbal inter¬action. Ineffective or poor IPC creates mistrust, confusion and eventual negative outcomes.

The goal of interpersonal communication for immunization is to bring about the positive behavior change necessary to ensure that children complete the full immunization schedule. For parents and caregivers it often takes time to change their current attitudes and behaviors. It is important to understand the parents' level of knowledge, attitude and beliefs. Any attempt to change their behavior depends on these factors.

One has to understand the whole issue from a caregivers' view and understand the challenges that a caregiver may face when they come to the health facility for their child's vaccination.

i. They come to a hospital early in the morning and wait a long time.
ii. Sometimes the child cannot be vaccinated because the required vaccine is not available or the vaccination is denied due to some minor ailment.
iii. Health workers often loose temper due to their work pressure.
iv. Health worker criticizes a parent in front of others for not having returned exactly on the due date.
v. New parents often fail to completely understand what the health worker is trying to say and afraid to ask questions.
vi. Health workers make feel ignorant for asking them to explain the purpose of the vaccination.
vii. The health worker doesn't tell when to bring the child back for more vaccinations.

Communication is important to sustaining uptake in any vaccination program. While the content of information should be evidence-based, the development and implementation of communication is not always grounded in communication science principles.

Barriers to effective communication

i. Language differences
ii. Use of technical terms, jargon and difficult words
iii. Poor clarity of speech and too much noise
iv. Excessive information
v. Lack of attention
vi. Different points of view
vii. Cultural differences
viii. Lack of trust
ix. Emotions
x. Conflicting body language
xi. The rush to serve many people waiting
xii. Caregivers' fear of speaking and asking questions

Strategies for better communication

The key points for designing effective communication and intervention strategies to increase vaccine acceptance and uptake are the following.

Communicating the reasons are not enough – Begin by understanding the target audience:

The development of effective strategies to sustain trust in vaccination programs requires an understanding of the particular social and psychological factors that determine the vaccination decisions of different populations with different vaccines.

Target the communications to the needs of your audience:

Communication is important to sustaining uptake in any vaccination program. While the content should be evidence-based, the development and implementation of communication is not always grounded in communication science principles.

Communicating to people is not enough – Listen to and engage healthcare professionals too:

A recommendation from healthcare professionals (HCP) consistently emerges as an important determinant of vaccination acceptance. While HCPs are usually the most trusted source of information on vaccines, they themselves may be unsure about vaccination or vaccination conversations with their patients.

Communicating is not enough: Design culturally targeted interventions to improve access to vaccines:

There is enough evidence to conclude that vaccine hesitancy as one possible determinant of under-vaccination across the world. Non-vaccination of children are mostly due to challenges related to awareness, acceptance and affordability (both financial and indirect non-financial costs).

Designing effective communication and intervention strategies to increase vaccine acceptance and uptake is the need of the hour. The context matters and communications must be designed to fit the needs and motivations of individuals. Along with research, expansion, monitoring and advocacy there has to be efforts to develop evidence based communications and interventions that are culturally acceptable and contextually appropriate.

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Dr Jaydeep Choudhury
Editor in Chief

President's pen

Arun Kr Manglik
President, West Bengal Academy of Pediatrics, 2018

Dear Academecians,

First and foremost a Very Very Happy and Healthy 2019 to you and your family.

I, your Chief Sebak as you may call me, am writing to you in that capacity for one last time. I have had quite a few opportunities to communicate with you over the last year be it at conferences, through this esteemed journal of yours or at social or academic meets. I really relish all those sweet moments.

As it is the norm, change is the evergreen virtue of life or else things will stagnate so I am to now relinquish the most coveted post of President WBAP. I certainly leave the reins with a great degree of satisfaction and happiness having got the huge love, affection and support of all of you WBAP members.

Looking back over the shoulders one feels really nostalgic having seen the rather turbulent phase in 2017. The year 2018 has been a watershed year for WBAP with many firsts which you all saw for yourselves.

2018 saw WBAP bounce back in academics, some activity being there almost every week. The monthly clinical meeting saw a resurgence in interest amongst members and PGs and so also the attendance at the monthly PG classes taken by our renowned teachers improved significantly. Our Scientific Secretary, Dr Amitava Pahari as is expected of him, set really high standards for himself, and achieved way ahead of what we had bargained for. As a first time venture we had a 3hour YUVA CME (only members below 40yrs of age were speakers) during our state Pedicon. I personally sat through all of three hours and believe me the youngsters had quite a few lessons for the experienced campaigners.

The year began with the yearlong academic calendar of WBAP being published in the form of a Table Dairy with all information in it being posted to all members by February end of 2018. This was the first time WBAP had done that and it set the ball rolling for a new agenda of many Firsts for 2018.

The long standing amendments to WBAP constitution were achieved by the colossal efforts of the Constitution Committee led by Dr Bhaskarmoni Chatterjee was another feather in our cap. Sincere thanks to Sir and his team for getting things done so smoothly.

Elections are the part and parcel of any democratic process. Reforms in this area too were a priority. This year WBAP became the first and till now the only. IAP branch to have set in motion Electronic voting, a demand of a large section of our members. This made the entire process far easier and smooth.

Our District and Local Branches have also done a lot during this whole year. Almost all branches have seen a spurt in academic, community and fellowship activities. Central IAP through the

Presidential Action Plan have been so very instrumental in awarding many District Branches several workshops. Thanks a ton to our very active VP 2018, Dr Arup Roy. As a matter of fact WBAP did hold an EB meeting in the Districts, again another first, that in March 2018.

We are all now practising under the constant threat of the legal sword and the “danda” of goons. To somewhat prepare ourselves for these eventualities the WB Medicolegal Chapter was formed with Dr Indranil Chowdhury as its Secretary. The branch is quite active. Another state branch of Allergy Chapter was formed under the leadership of Dr Binayak Roy. Thus there is significant decentralisation of activities with involvement of many more young members. Thanks to all.

Another first this year was waiving off the WB Pedicon registration fee of Rs 4000/- for new CIAP members from WB. This helped in bringing almost a score of young members to our fold. And expecting to save a fair amount from WB Pedicon, again your EB has proposed a SPONSORFREE, REGISTRATIONFREE 'AWESOME' CME sometime in April 2019, ie practically sponsored by WB Pedicon 2018. So this was another first.

Finally your EB is in the process of alloting CIAP programs to various district or local branches of WB with funds from WBAP. Hope this materialises and we see another burst of academics all through 2019 under the very able leadership of Dr Mousumi Nandy.

After such an activity packed year, I must thank your entire EB, OB for their whole hearted all round support at all times peppered with several constructive criticisms which really forms the backbone of any democracy. In fact, each and every member of WBAP has contributed in his or her own way in achieving the phenomenal success in 2018. Huge thanks to all of you.

Dr Pallab Chatterji needs a very special mention being rock solid behind me throughout the year. He is such a workaholic par excellence that left me with only to be a guiding light. Thanks is only a small way of expression, but I do have a lot of gratitude to Pallab, because without him we may not have had achieved even half of what we actually did.

Dr Jaydeep Choudhury, the Editor of this Journal, the last issue of 2018 which you are now reading has spent hours and hours getting articles and useful writeups for publishing. Despite a peculiar apathy towards writing and making contributions to our mouthpiece amongst our members Dr Choudhury has almost single handedly achieved the goals set for him.

I know I am to gradually fade away into oblivion but WBAP will march forwards with a greater gusto than ever before. You can be rest assured the leadership is in very capable hands.

Again wish you all a very Healthy, Happy and Safe 2019 and during the years to come.

Long live WBAP Long live IAP
Arun Kumar Manglik

Transient Synovitis Mimicking Perthes Disease

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Introduction

Transient synovitis of hip is a reactionary collection of aseptic fluid in the joint cavity secondary to common childhood viral infections[1], many a times infection remains undetected. As there is minimal dyscomfort ,it remains undetected for long time in a child. Due to pressure effect on the head of the femur, blood supply is compromisedand secondary degeneration of head. we report a similar case in a 5 year old female.

Case Report

5 year oldhealthy girl complaints of discomfort during walking in right hip for last 15 days. No history of trauma, fever, nocturnal pain or progressive pallor. On investigation ESR, CRP , WBC count were normal.Common prothrombotic situation including protein C , protein S, factor V leiden mutation, ANA Ds DNA, HPLC for sickle cell anemia were inconclusive. X-ray both hip AP view (Fig 1)showed compression collapse ofanteriomedial aspect of femoral head and increased joint space on right side. MRI right hip(Fig:2) shows compromised vascularity with a chink of fluid collection in the posterior superiomedial compartment.

She was advised bed rest for four weeks with traction , immobilisation of right lower limb. Clinical and radiological improvement was evident in subsequent xray.

Discussion

Legg- Calve-PerthesDisease (LCPD)[2] is a hip disorder of unknown etiology that results into temporary interruption of blood supply to femoral head leading to osteonecrosis and femoral head deformity.Factors responsible for vascular compromise and prothrombotic conditions were not found in this case. The amount of pressure exerted by the synovial fluid obstructing the venous flow leading to further increasing intra osseous pressure which in turn compromise arterial flow causing ischemia and cell death[3].

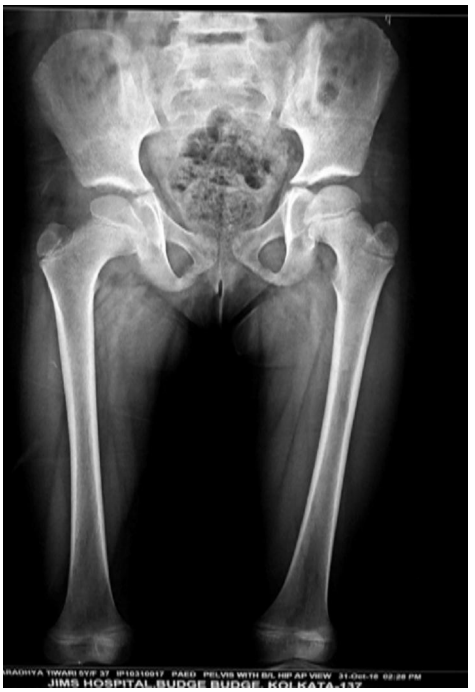

Fig 1. Compression collapse ofanteriomedial aspect of femoral head and increased joint space on right side

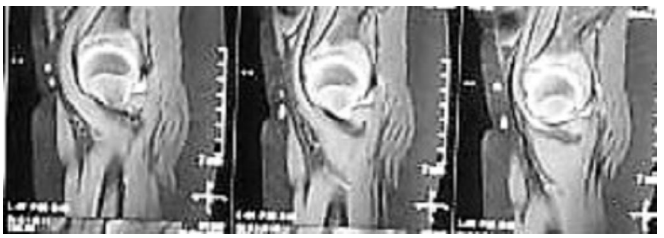

Fig 2. Compromised vascularity with a chink of fluid collection in the posterior superiomedial compartment

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Transient synovitis(TS) of hip has a good prognosis and it is a self limiting diseases . But if the diagnosis of TS is delayed it may create a pressure sufficient to cause obstruction of venous flow and formation of avascular necrosis mimicking Legg-Calve-Perthes Disease. In our case 15 days of asymptomatic interval is responsible for pathogenesis of vascular compromise .

All pediatrician treating transient synovitis of hip should consider this fact and involve orthopaedics colleague for opinion and if required intervention.

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Opsoclonus Myoclonus Syndrome : A Presenting Feature of Scrub Typhus in A Child

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Abstract

Scrub typhus is a mite borne infection, caused by Orientia tsutsugamushi. It is a common cause of fever, especially in the Indian subcontinent. Although it is well known that the infection can affect various systems, and present itself in myriad ways, we present a rare finding of opsoclonus myoclonus associated with scrub typhus infection. It emphasizes on how even common and well known diseases can have unusual manifestations.

Key words: *scrub typhus ; opsoclonus ; child*

Introduction

Scrub typhus is transmitted by trombiculid mites and is endemic in East and Southeast Asia and Northern Australia. The clinical syndrome classically consists of a fever, rash, and eschar, but it can also present as an undifferentiated fever[1,2]. We present a case of scrub typhus with a rare neuro-ophthalmic manifestation. Our patient presented with fever and opsoclonus-myoclonus, was subsequently diagnosed to have scrub typhus and completely improved upon treatment with antirickettsial drug. This phenomenon highlights the increasingly complex presentation of common diseases. It also indicates there is much to be discovered about the immunopathogenesis of this infectious disease.

Case Report

A 3 year old male child, a product of non-consanguineous marriage, was admitted with history of high grade, intermittent fever and irritability for 12 days, irregular movement of eyes in different directions and jerky movement of limbs for 10 days. He was born at term with a normal developmental history.

There were spontaneous rapid saccades in all directions of gaze, with myoclonus involving the periorbital, truncal and limb muscles without loss of consciousness.On further examination,the growth parameters were within normal limits. He was febrile, hemodynamically stable, normotensive with a hepatomegaly of 3cm.There were no rashes or eschar. Dilated fundoscopy showed disc and margins were normal and clear respectively and no papilledema with a healthy macula. With a provisional diagnosis of meningitis, he was given IV ceftriazone and valproate along with other supportive management like IV fluids after sending relevant investigations including blood and urine cultures. Investigations revealed normal blood counts and electrolytes. Common infective causes like malaria, dengue were negative in screening. USG abdomen was normal except hepatomegaly. CSF analysis showed lymphocytic pleocytosis (cells20/cumm, lymphocytes 95%), sugar 92mg/dl (Blood glucose-118mg/dl),protein35 mg/dl. CSF and blood for Japanese encephalitis IgM were non-reactive. Blood culture yielded no growth. MRI brain was normal .In the meantime Scrub typhus IgMby IFA report came to be Positive with high titer value (ODV= 1.7979 ; COV = 0.500). He was started on oral doxycycline as per ICMR guidelines. He became afebrile by day 5 and his neurological symptoms gradually subsided by day 10 of admission and is now doing well at 3 months of follow up.

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Discussion

Rickettsial infection is one of the common causes of acute undifferentiated fever in Southeast Asia .The clinical presentation of rickettsial diseases ranges from a mild, non-specific febrile syndrome to a life-threatening fatal condition. They may mimic tropical febrile illnesses such as malaria, dengue fever, typhoid fever, and leptospirosis. Scrub typhus can also manifest with potentially life-threatening complications such as lung injury, shock, and meningoencephalitis[1-5].

Opsoclonus is a movement disorder characterized by multidirectional saccadic eye movements. Broadly, it may be caused by malignant, infectious or idiopathic processes. The most common diseases associated with the Opsoclonus-Myoclonus syndrome (OMS) are malignancies, with small cell carcinoma lung and breast cancer being the commonest in adults. In the pediatric population, more than 50% of cases are due to an underlying neuroblastoma. However, the number of non malignant diseases reported with OMS is steadily increasing[6]. Recently, the syndrome has been described in association with Streptococcal infection, and was found to have antibodies to a novel protein called neuroleukin found in the CNS. It has also been described in viral infections like EBV and CMV. It is important to note that apart from paraneoplastic and infectious, the other causes are far less commonly seen, and have only been noted in isolated case reports. There have been few previously reported cases of opsoclonus in scrub typhus in adults[7,8] but none has been described in association with scrub typhus in children. This phenomenon highlights the increasingly complex presentation of common diseases. It also indicates there is much to be discovered about the immunopathogenesis of this infectious disease.

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Case Report

An Unusual Association of Acute Lymphoblastic Leukemia and Ulcerative Colitis

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Abstract

Background : Prodigious association of acute lymphoblastic leukemia and ulcerative colitis. A 5 year old male child presented with ALL and 4 years later with ulcerative colitis.

Observation : It was a rare association between these two diseases.

Message : Common genetic factors can be presumed to cause both the diseases and it needs further research.

Introduction

Acute lymphoblastic leukemia (ALL) is the most common malignancy in pediatric age group.It is the first disseminated cancer which is curable[1]. Advances in recent times have resulted in significant improvement in survival of ALL patients.

Ulcerative colitis is an idiopathic inflammatory disorder involving colon; presenting with passage of blood and mucus in stool[2].Children with ulcerative colitis are at increased risk of colon carcinoma in second decade of life.It is a rare association of leukemia/myelodysplastic syndromes[3] with inflammatory bowel disease.

Here we are presenting a case report of acute lymphoblastic leukemia presenting later on with ulcerative colitis, which is a rare association, with few case reports published till now[4].

Case Report

A five year old male child presented with complaints of swelling over neck for 1 month and bone pain since 1 week.No history of fever or cough.His past and family history were insignificant.

Physical examinations revealed bilateral significant cervical lymphadenopathy; multiple, non-tender and discrete. Sternal tenderness and hepato-splenomegaly were detected.On investigation hemoglobin 7gm%,platelet 40,000/mm^3, TLC-80,000/mm3,>37% blasts in peripheral smear.

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Bone marrow examination revealed mild hyper cellularity with 45% blasts (lymphoblasts). Immuno-phenotype[5] showed CD 10,CD19 +ve,CD64 -ve,suggestive ofB Cell Acute lymphoblastic leukemia. Cytogenetic study showed no evidence of ETV6RUNX1 but Tri tetrasomy of 21 was detected.Child was managed with protocol of MCP841[6] for management of ALL.Duration of treatment was 3 years.No relapse on follow-up.

After four years of completion of treatment child was admitted with passage of fresh blood in stool and altered bowel habits of 14 days. Abdomen and per rectal examination was normal.No evidence of atypical cells in peripheral smear.LFT and Prothrombin time were normal.Fecal calprotectin was positive.Colonoscopy revealed marked inflammation with loss of vascular pattern and friable mucosa,ulcerations,spontaneous bleeding present, suggestive of ulcerative colitis.It was confirmed by rectal biopsy. Child was started on immuno-modulator mesalamine[7] and responded.

Discussion

It is a rare association of ulcerative colitis with acute lymphoblastic leukemia,with few case reports published till date.Usually ulcerative colitis in pediatric age group have a monogenic factor as an etiological cause.In one of the studies,relative risk of leukemia in patients with ulcerative colitis was reported as statistically significant[8]. Our report suggests that there may be an increased risk of leukemia, in ulcerative colitis. The causal relationship, if any, remains yet to be determined.

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A Case of Anemia in Neonate with Rare Etiology

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A male baby born out of non consanguineous marriage presented to us at 1.5 month age with severe anemia and huge hepatosplenomegaly(spleen was upto the umbilicus).There was history of a male sibling death at 2 years of age who had history of recurrent fractures. There was another female sibling who was 8 years old and thriving well. However no documents of the expired sibling were available at that point of time. On examination the child was found to have inadequate weight gain. Weight was less than 3rd centile whereas head circumference was in 50th centile. There was also mild prominence of the forehead. There was no lymphadenopathy, jaundice or rashes. Antenatal and perinatal history were unremarkable and TORCH screening of mother was negative. As a routine work up for anemia, peripheral blood smear was done which revealed severe anemia (Hb =6g%).The total leucocyte count was on the higher side 16000/cu mm,platelet count was low(26000/cu mm),LDH was high(1060 U/L)and reticulocyte count was 2%.There were no abnormal cells in the peripheral smear. Since two cell lines were depressed, a bone marrow examination was our next plan of investigation to exclude leukemia. Another possible differential was any condition that would suppress the bone marrow. There was no history of drugs either which could have been contributory. As there was history of recurrent fractures in the sibling, a skeletal survey was done which showed sclerosis of almost all the bones. The reports of the sibling were then reviewed and the radiographs and MRI of the sibling showed evidence of sclerosis too. From X ray it was evident that our child had Osteopetrosis (Fig 1) and his sibling too had been suffering from a similar condition (Fig 2,3). Since both the sibs were male, a possibility of X linked recessive disorder or even an Autosomal recessive disorder was suspected.

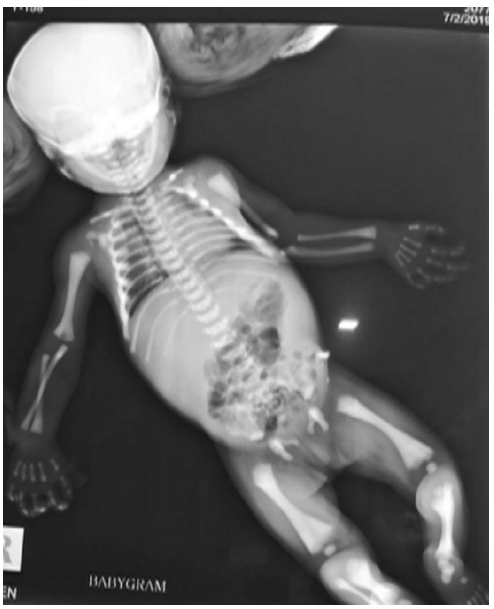

Fig 1. Babygram of the neonate

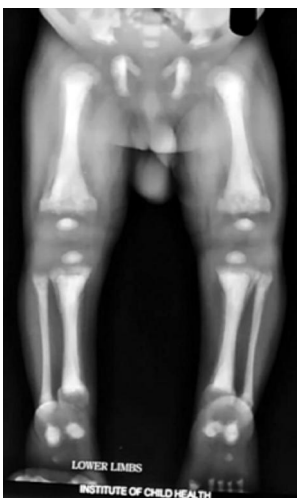

Fig 2. X-ray of lower limbs of the sibling

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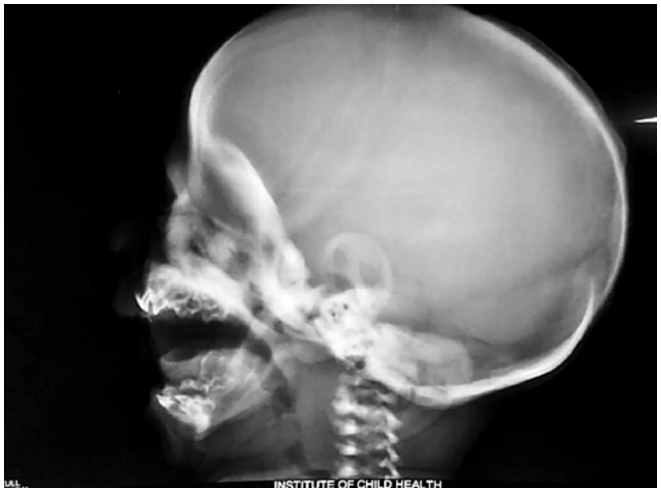

Fig 3. Xray of the skull of the sibling

An autosomal dominant disorder is usually not so severe and presents later in life. Genetic study was planned accordingly but the parents could not afford. To know the type of Osteopetrosis and to decide the line of further management, a bone marrow examination was done which showed "osteoclast-poor" variety, which had a very poor prognosis. Eye check up was done by ophthalmologist which revealed bilateral optic nerve atrophy. Hearing screening was however normal at that point of time.So a diagnosis of Osteopetrosis was made probably Autosomal Recessive variety which carried a very poor prognosis The baby was given supportive treatment and the parents were counselled.

Discussion

Osteopetrosis or "marble bone" disease or "Alberg Schonberg"disease is a condition where there is sclerosis of the skeleton. There are atleast 9 forms with different modes of inheritance.There is a wide spectrum of manifestations ranging from features of bone marrow failure in infancy to incidental finding in radiographs(osteopoikilosis).

Pathogenesis:

It may be due to reduced or complete lack of osteoclast function and hence bone resorption[1]. In about 2/3 of children, osteoclasts are formed normally but are unable to resorb bone effectively due to mutations in H+ or Cl- transport[2].Rarely osteoclast may be totally absent(Osteoclast –Poor Form) and the genetic defect in these forms have been recently linked to RANK L gene and RANK molecules which are key factors in preosteoclast fusion[3,4] or enzymatic defects[5].

Classification :

For practical purpose OP has been broadly classified into following types according to The consensus guidelines of ESID and EBMT working Party Inborn errors (Table 1).

A good history including family history and history of consanguinity is very essential. The child may present in infancy itself with anemia and hepatosplenomegaly or may present in early/ late childhood with mild anemia, skeletal deformities esp. skull and thorax, pathological fractures or vision impairment.

Depending on the clinical presentation we plan our set of investigations. As a routine evaluation for anemia, peripheral blood smear, blood counts, reticulocyte count and LDH are done. Low haemoglobin,reticulocyte count and platelet counts may correrelate with bone marrow failure as was in our case. However leucocyte count, immature granulocytes and LDH may be raised possibly due to extramedullary hematopoiesis. For these reasons, Acute Leukemia may be considered as a close differential.

Radiology :

Diagnosis of OP is basically by simple x ray. At least radiograph of one extremity Fig 2, skull Fig 3.and thorax are required to look for the morphology, extent of osteosclerosis, bone marrow narrowing and head deformities. In neonates like in our case a babygram may be done to see the sclerosis of bones (Fig.1). We should also check for growth plate widening as a sign of osteopetrorickets in some cases.

Neuroimaging with MRI/ CT is recommended to detect hydrocephalus, narrowing of central nerve channels and neuropathic changes(like cerebral atrophy and corpus callosum agenesis)[6,7].

Other investigations include Ultrasound evaluation of abdomen and hips before HSCT, US Doppler of liver vessels to look for venoocclusive disease and Echocardiography to look for PAH, post transplant.

In addition,pH of blood and urine should be checked to detect Renal tubular Acidosis due to carbonic anhydraseII deficiency in a subtype of OP. Basic bone parameters should also be done to look for hypocalcemia. Bone marrow analysis is required to detect "osteoclast Poor"forms and also for genetic analysis. Trephine biopsy is usually required as marrow aspirates are scanty.

Table 1 : Classification , Genetics and Clinical manifestations of Osteopetrosis

OP	Age at presentation	Inheritance	Gene	Growth retardation	Hypo-Calcemia	Haematol Impairment	Visual Impairment	CNS Symptoms	Bone/Bone Marrow *Morphology
Infantile malignant Autosomal Recessive Osteopertosis (ARO)	<1 years	Autosomal Recessive	TCIRG1	+ to +++	+++	+++	+ to +++	0 to ++ (Hydrocephalus)	Normal or high osteoclast counts
			CLCN7	+ to +++	+++	+ to +++	+ to +++	0 to +++ (Hydrocephalus, neurodegeneration	
			OSTM1	+ to +++	++	+ to +++	+ to +++	+++ (Neurodegeneration)	
			RANK	++	+	+	+ to +++	0	No or reduced osteoclast counts
			RANKL	++	+	+	+ to +++	0	
Intermediate Autosomal Osteopetrosis (IAO)	1-10 years	Autosomal Recessive or Dominant (see CLCN7)	CLCN7 may be involved in IAO as well					0	
			CAII	+	+	0 to +	- to +++	Cerebral calcifications, Mental Retardation	Renal tubular acidosis
			PLEKHM	++	0	0	0	0	Bone deformities, pain, chondrolysis
Benign Osteopetrosis (ADOII/ Morbus Albers-Schonberg)	10-40 years	Autosomal Dominant	CLCN7	0	0	0 to +	very rare	0	Scoliosis, arthritis, Osteomyelitis
			PLEKHM	0	0	0	0	0	Focal osteopetrosis, osteopenia

Some patients may have immunological impairments like hypogammaglobulinemia.Hence Ig G, Ig A, IgM and Ig E analysis is recommended as well as Ab response to immunisations.

Detailed neurogical examination , visual assessment including assessment of retina, optic nerve , vision and VEP as well as hearing assessment are essential in a child with OP

Management

Till date no definite treatment exists.Bone marrow failure has to be treated symptomatically with transfusions or GM CSF. There may be fractures due to brittleness of the bones and secondary complications like osteomyelitis, non union or delayed union[8]. VEP needs to be checked at regular intervals to detect optic atrophy and accordingly prophylactic surgical decompression of the optic nerve needs to be performed to prevent loss of vision[9]. Routine dental check up is also essential as there may be delayed tooth eruption, abscess,or severe complications like osteomyelitis of the mandible.Hence maintenance of good oral hygiene is important.

Hematopoietic stem cell transplant (HSCT) may be tried for severe forms of AR osteopetrosis. HSCT using HLA identical donors results in 73% 5 year disease free survival[10]. Results were better with HSCT done early in life before the age of 3 months[11] and chances of failure increase if done after 10 months .It should be seen whether there are definite indications of HSCT like hematologial failure or visual impairment. The absolute contraindications for HSCT are neuropathic OP, extrinsic osteoclast defects caused by mutation in RANK L gene . In older children above 3 years, HSCT may lead to severe post-transplant hypercalcemia which may require treatment with bisphopsphonates[12].

In the post transplant period, OP children are more prone to develop certain complications like veno occlusive disease and post transplant respiratory problems like acute severe Pulmonary arterial hypertension(PAH) in the first 90 day after HST for AROP. Hence PAH must be excluded in any child who becomes acutely breathless after HSCT for OP.

Prognosis

he infantile forms, as in our case , has very poor prognosis with children surviving barely beyond the first decade of life. A good family history may give a clue to the diagnosis. Genetic diagnosis and genetic counselling are very important aspects which may aid in the management as well as prevention of recurrence in future pregnancies.

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Acrodermatitis Enteropathica : A Presenting Feature of Cystic Fibrosis

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Abstract

Background : Cystic fibrosis a multisystem disease, usually presents with pulmonary and gastrointestinal manifestations,but can also manifest with nutritional dermatoses eg.acrodermatitis enteropathica.

Case characteristics : 4 month old infant presented with rash followed by cough.

Observation : He was diagnosed to have cystic fibrosis based on sweat chloride test.

Message : Cystic fibrosis can be one of the differential diagnosis in a case with acrodermatitis enteropathica.

Introduction

Acrodermatitis enteropathica is a rare autosomal recessive disorder caused by malabsorption of zinc,usually manifests as cutaneous eruptions of eczematous,dry,scaly lesions in perioral, acral, perineal areas, knees and elbows[1]. Rapid response seen on starting zinc supplementation.

Cystic fibrosis is inherited as a multisystem disorder of children and adults.It usually presents with pulmonary and gastrointestinal manifestations[2]. There are case reports with cutaneous manifestations mostly in European[3] and American[4] population.

Here we present a case of 4 month old child presented initially with acrodermatitis enteropathica and later with pulmonary manifestations and finally diagnosed as cystic fibrosis.

Case Report

A four month old male child presented with 8-10 episodes of loose stools and rash for 3 days.Child was exclusively breast fed. Child had a normal vaginal delivery at 38 weeks of gestation to non-consanguineous parents. Birth weight 2.8kg. Post-natal period was uneventful. Passed urine and stool on first day of life. Child attained developmental milestones as per peer age group.Immunized for age. No history of inherited disorders in family.On admission, weight was 4.9 kg(<3rd centile),length-62cm(>3rd centile),head circumference 38cm(<3rd centile).

Child had dry desquamating,erythematous rash[5] present perioral,neck area,upper and lower limbs,perianal region. Had features of mild dehydration.Microcephaly detected. Liver was 3 cm palpable below right coastal margin. Serum zinc was 32 mcg/dl which was suggestive(<50mcg/dl)[1] of acrodermatitis enteropathica.TORCH screening positive for cytomegalovirus IgM antibody. Dehydration was corrected as per protocol and therapeutic zinc supplementation was given @1mg/kg/day.Rash subsided,loose stools reduced and child was discharged on day seven after admission.

Child was readmitted after 10 days with cough and respiratory distress for 4 days. O/E child was tachypneic with subcostal and intercostal retractions,chest x-ray showed bilateral hazy opacities with hyperinflation. Initial diagnosis of bronchiolitis was made and child was treated with oxygen and nebulisation (Levolin,3% hypertonic saline) and other supportive measures.He responded initially and worsened later on. He had waxing and waning course during hospital stay for

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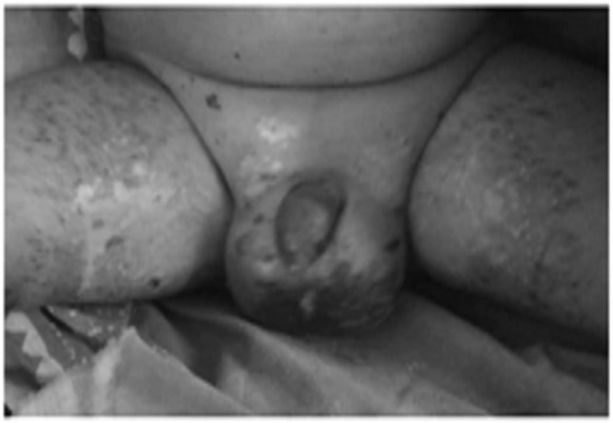

Fig 1 : Dermatosis

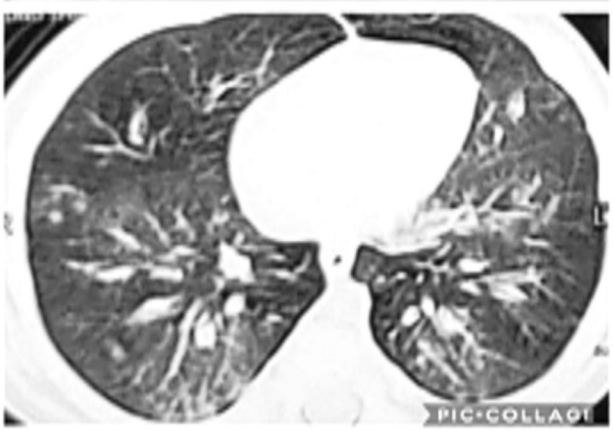

Fig 2 : CT scan lungs with ground glass appearance

7 days,so possibility of systemic disease was suspected and investigations were sent accordingly.CT Thorax showed diffuse ground glass opacity.Investigations were negative for HIV,Tuberculosis,and primary immunodeficiency. Sweat chloride test had chloride of 87mEq/l and 91mEq/l respectively, on two separate days.

Figure 1 and 2 showing dermatosis and CT scan lungs with ground glass appearance.

Specific mutational analysis for F508 was negative.After the confirmation of cystic fibrosis child was treated with azithromycin, nebulisation with salbutamol,3%hypertonic saline and was followed up with chest physiotherapy; nebulisation started with budesonide,fat soluble vitamins and pancreatic enzymes (Creon) were supplemented.

Discussion

Usual manifestation of CF is with pulmonary symptoms. This child had a preceding nutritional deficiency, Acrodermatitis enteropathica (AE).Recently Yarmuch GP et al (6)described AE as initial manifestation of cystic fibrosis.Cystic fibrosis should be considered as a differential diagnosis in children presenting with cutaneous exanthema in malnutrition.

In conclusion, children with cystic fibrosis can present with dermatological manifestations,which is a part malabsorptive process of the disease(7) that may lead to hypo-protienemia, zinc and essential fatty acid deficiency.

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Complications Too Many In Sickle Cell Hemoglobin E Disease

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Background: Sickle cell hemoglobin E(HbSE) disease usually remains asymptomatic in children. But here we report a 12 years girl with sickle cell hemoglobin E disease presenting with vasoocclusive crisis, sequestration crisis as well as secondary hemophagocyticlymphohistiocytosis following viral infection resulting in a stormy course of critical illness eventually responding to packed cell transfusion, steroids and other supportive management.

Introduction

Sickle cell hemoglobin E disease(Hb SE) is a double heterozygous genetic disorder characterized by qualitative abnormality of hemoglobin[1]. Although population migrations and racial intermarriages have increased the numbers of individuals with compound heterozygotes for sickle cell hemoglobin(HbS)and haemoglobin E(Hb E) throughout the world, it is a rare variant of sickle cell disease in Indian subcontinent[2]. Hb E and Hb S mutation usually have mild presentations till late adolescence[3]. Here we report a rare case of a 12-year-old girl with Hb SE disease whopresented with sickle cell crisis and hemophagocytic lymphohistiocytosis (HLH) following viral infection . To the best of our knowledge, this is the first report of HLH with sickle cell crisis secondary to viral infection in a 12yrs old child with Hb SE disease from India.

Case Report

A 12 yrs girl from South 24 Parganas district of west Bengal , born out of non consanguineous marriage, presented in our pediatric emergency with fever for last 7 days associated with sudden onset pallor for same duration. Further she complained of low back pain for 6days along with pain in left upper abdomen for last 4 days. On examination she had severe pallor,tachycardia with high grade fever(temperature 103.5^{0}F) and icterus. There was tender moderate splenomegaly and mild hepatomegaly. She also had tenderness along the dorso lumbar spine but without any focalneurodeficit or altered sensorium. Other systems were within normal limit.

Her initial investigations revealed hemoglobin 5.2gm/dl, total leucocyte count (TLC)2.6×104/µL with predominant neutrophil count,platelet 1.6×105/µL, total bilirubin 4.8mg/dl, indirect fraction 4.1mg/dl, Lactate dehydrogenase 1592U/L, reticulocyte count-4.5%, direct coombs test-negative, glucose-6-phosphate dehydrogenase(G6PD) level-8.1U/gm of Hb, peripheral blood smear showed sickle cells along with anisopoikilocytosis, target cells. Malarial parasite was not found. Renal status was normal. Her antinuclear antibody was negative and serum ceruloplasmin was normal. On high performance liquid chromatography (HPLC), she was having HbS 51.1%, HbE along with HbA2 32.1% and fetal hemoglobin(HbF) 7.3% confirming her double heterozygous state for HbSand HbE. On family screening her mother turned out to be sickle cell trait and father as hemoglobin E trait and her sister has hemoglobin SE disease.

We started treating the patient with moist oxygen, intravenous fluids for adequate hydration, injection ceftriaxone, paracetamol and injection tramadol. Two units of packed red cell was transfused. MRI dorso lumbar spine was suggestive of vasoocclusive crisis. Although pain subsided with medication, patient continued to have high grade fever without

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focus. Meanwhile her Dengue IgM antibody, Widal test, Scrub typhus IgM antibody came to be negative.Blood and urine culture showed no growth. So we started workup for secondary HLH where repeat investigations showed hemoglobin 8.8gm/dl, TLC- 17.4×103/µL predominant polymorphs, platelet 5×104/µL,LDH- 2514U/L,Triglyceride-267mg/dl ,ferritin-10,500ng/ml ,ESR- 56mm 1st hour, C reactive protein(CRP)-250mg/dl, liver enzymes- SGPT-355U/L, SGOT-435U/L suggestive of secondary HLH as per revised diagnostic guideline of HLH-2004[4].

Meanwhile tests for parvo virus B19 IgMAb(>48) and Ebstein bar virus IgM antibody against Viral capsid antigen(78.4) came to be positive. We gave pulse dose of injection methylprednisolone for five days. Fever subsided and patient improved clinically.Repeat tests showed improvement in laboratory parameters like hemoglobin 11.3gm/dl, TLC-9.9×104/µL, platelet 2.4×105/µL, ESR 10 in 1st hr, CRP 6mg/dl, LDH 167 U/L, serum triglyceride 87 mg/dl, serum ferritin 735 ng/ml.

Subsequently patient was discharged in stable condition and she is doing well in follow up.

Discussion

Here we presented anunsual case of HLH with sickle cell crisis secondary to viral infection in a child with Hb SE disease.

In India the prevalence of sickle cell disease(Glu6Val), varies from 4–44%, occurring mainly in Chhattisgarh and Jharkhand tribal areason the other handHb E thalassemia(Glu26Lys)is most frequent in the eastern and north eastern part of India[2]. Although HbSE is usually a milder disorder, affected individuals may have a chronic anemia secondary to hemolysis and recurrent episodes of vaso-occlusivecrises following fever, dehydration etc.[3].

On the other hand, HLH is a clinicopathologic condition characterized by fever, hepato-splenomegaly, at least bicytopenia, hypertriglyceridemia, liver dysfunction, with or without histologic evidence of hemophagocytosisin bone marrow[4]. There are two main types ofHLH namely hereditary (familial) and a secondary type which has been associated with infection, malignancy, connective tissue disorders.HLH is a very fatal disease which if left untreated can even lead to death of a child.

In our case,the basis of association of HLH with sickle cell crisis suggest that they may share somecommon pathways in their pathophysiology. Firstly patients with sickle cell disease in steady state have been shown tohave zinc deficiency that can be exacerbated by sicklecell crises[5].Zinc deficiency results in decreased activity in NK cells in murinemodels[6] and humans with and without sickle cell disease. Secondly, elevated levels of cytokines IL-6 ,interleukin-2 receptor (IL-2R) ,and TNF-a, have been found in patients with sicklecell crisis[7], which are also implicated in the pathogenesisof HLH.In literature there is evidence of Parvo virus induced splenic sequestration crisis[8] and Ebstein bar virus trigerredhemophagocytosis[9]. But occurrence of both the phenomenon together in a child following theseviral infection is very rare.

In our case though the girl partially responded to fluid therapy and packed cell transfusion, her fever was persisting for a prolonged period with abnormal laboratory parameters provoking us to start workup for HLH and give high dose steroids .The child improved completely and was put on regular follow up.

HbSE disease presenting for the first time with secondary HLH , splenic sequestration crisis and vasoocclusive crisisat such an early age is probably the first case in world literature[10].This case aims to increase clinician's awareness of HLH in the setting of infectious process in a child having sickle cell crisis, as mortality rates are high and early diagnosis and treatment are mandated to improve outcomes.

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Fast Food, Fruit Juices, and Energy Drinks

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Increasing and alarming fast food consumption has engulfed every race and every age with the newest entrants being school children and adolescents. Before we discuss the scenario of fast food, fruit juices and energy drinks consumption in children and adolescents in India we define few terms.

Definitions

- Fast food: Refers to food that may be served ready to eat. As per Merriam Webster online dictionary fast food is "designed for ready availability, use, or consumption and with little consideration given to quality or significance".
- Junk food (JF) OR Unhealthy (Junk) Foods: Working Group Members on Matters related to Junk foods and Addressing Problem of Obesity in India in 2015 defined Junk food as "any foods (food or drink, packed or non-packed, processed or non-processed) which contains little or limited presence of proteins, vitamins, phytochemicals, minerals and dietary fiber but are rich in fat (saturated fatty acids), salt and sugar and high in energy (calories) that are known to have negative impact on health if consumed regularly or in high amounts. Junk food may also contain carbonated beverages"
- The term "HFSS food" is used in place of junk food which is understood: "foods (any food or drink, packaged or non-packaged) which contain low amounts of proteins, vitamins, phytochemicals, minerals and dietary fibre but are rich in fat (saturated fatty acids), salt and sugar and high in energy (calories) that are known to have negative impact on health if consumed regularly or in high amounts."
- Foods with similar attributes -EDLNF, EDNPFC: Energy dense low-nutrient density foods or energy dense and nutrient poor foods for children and FMNV: Foods of minimal nutritional value
- Newer and evolving concepts of classifying food: NOVA classification- classifies all foods and food products into 4 distinct groups on types of processing underlying each group.

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Consumption

A recent panIndian survey recently by Centre for Science and Environment in 13,274 schoolchildren in the age group 9–17 years from 123 districts spread across 24 states and 1 union territory concluded that almost every child consumed packaged sugar-sweetened beverages (92.1%), salted packaged food (94.3 %) and sweet packaged food (95.1%) with every other child (53%) consumed packaged food or beverages at an average of at least once a day.Similarly increase in fast food or QSR sales and revenue are seen and rising further and expected to quadruple in 2 decades through 2021. There is also increase in consumption in fast food and visit to quick service restaurant in India in past years. The following factors are major reasons for boost in sales and growth of fast food in India as concluded by FICCI report 2018.

- Favourable demographics
- Increasing urbanization
- Increase in women workforce
- Growing middle class
- Nuclearization
- Higher experimentation and changing consumer preferences
- Increasing Indulgence in smaller cities
- Eating-out as an experience
- Online delivery/digitalization

Sugar-sweetened beverages (SSB):

These are drinks with added sugar including non-

diet soft drinks/sodas, flavored juice drinks, sports drinks, sweetened tea, coffee drinks, energy drinks, and electrolyte replacement drinks. Similar to reports on junk food the trends show huge and increase share of fruit juices and caffeinated drinks market in India.

National Family Health Survey (2005–2006) for children aged 6–59 months (n=30,656) concluded that 10 % of Indian children had no water in the last 24 h (12,700,000 children nationally) of which 24 % consumed formula, "other liquid", juice, or two or more beverages. Children over 2 were more likely to consume non-milk beverages, including tea, coffee, and juice than those < 2 years.

Energy drinks were first introduced by the name of 'Dr. Enuf' in US (1949) then in Europe and Asia(1960s) with > 300 variants of energy drinks are available today. Sales of energy drinks in the UK increased by 155% between 2006 and 2014, from 235 to 600 million litres. Similarly, energy drink market in India was pegged at Rs 700 crore in 2013 and (Mukherjee A 2013) and USD 155 million in 2017 with CAGR of 9% during 2018-2023.

Adverse Effects

Fast food :

- Fast food consumption adversely affects the nutritional quality of diet and may potentiate obesity. Studies have shown that consumption of fast food affects the dietary quality in such a way that promotes obesity.
- Fast food consumption is associated with increased cardiometabolic biochemical risk markers. Many studies have shown a positive association between "unhealthy" dietary patterns (i.e. diet composed of ultra-processed products, poor in fiber and rich in sodium, fat, and refined carbohydrates) and cardiometabolic alterations in children and adolescents. Unhealthy eating patterns have been referred to by authors in various terms like ''Western'' by most studies on fast food.
- Association between fast food consumption and high blood pressure: Studies show inconsistent results regarding the association between fast food consumption and hypertension in children and adolescents.
- Association between fast food consumption and psychological symptoms:A number of surveys have demonstrated that fast food consumers are prone to adverse psychological behavior.

Energy drinks :

- Excessive intake of carbohydrate and calories through energy drinks causes increase in body weight.
- Cardiovascular effects from high levels of caffeine in energy drinks: Caffeine is structurally similar to adenosine and, thus, binds to its receptors, resulting in a subsequent block of adenosine's actions. The effects of caffeine on cardiovascular system include increase in heart rate and blood pressure. In an overdose condition, tachycardia followed by arrhythmias and hypotension can occur.
- Neurological and psychological adverse effects from intake of energy drinks on sleep and psychiatric behavior.
- Energy drink use and high-risk behaviors: Several studies in college students, have found a positive association between the typical number of CCEDs consumed per week and alcohol dependence and alcohol related problems.
- Energy drinks cause dental erosions.

Fruit juices :

- Pharmocokineticsand pharmacodynamic interactions of fruit juices with drugs.
- Malabsorption and diarrhea from fruit juices.
- Fruit juice consumption causes excessive free sugar intake resulting in overweight and obesity.
- Microbial contamination in fruit juices;
- Dental caries;
- Malnutrition due to early introduction of fruit juice in infants.

With the rising trend of consumption of fruit juices, energy drinks and fast foods, countries across the world have been trying various strategies to decrease their intake thereby reducing the associated adverse effects.

Recommendations and Policies

Fast food :

The Science Advisory Committee for Nutrition (SACN) from U.K. in 2015 published its report on Carbohydrates andHealth, who after going through all evidences, recommends free sugars intake of

5% or less of total dietaryintake for adults and children aged over two years. During the same time In 2017, the ESPGHAN Committee on Nutrition also advised to reduce free sugar intake to<5% of energy intake for children 2-18 years and even lower for those below 2 years. In terms of fat consumption WHO in its evidence based guidelines advised that total fat should not exceed 30% oftotal energy intake. It further states that saturated fatty acid intake should be <10% of total energy intake.PUFA should be preferred as replacement of energy to decrease the trans fatty acids to <1% as recommended.American Academy of Pediatrics also recommends the same.Further WHO advises salt intake should be less than 5 gm per day (2g/day sodium) which should be adjusteddownward for children based on their energy requirements relative to those of adults as excess is known tocause water retention, weight gain, and hypertension.

Fruit juices :

In one of the most recent development, American Academy of Pediatrics(AAP) released its recommendations on intake of fruit juices in children in June 2017. The group recommendsjuices to be introduced only beyond 12 months of age. Although whole fruit is to be encouraged, up tohalf of the servings can be provided in the form of 100% fruit juice (not fruit drinks). A 6-ounce glass of fruit juiceequals 1 fruit serving. Knowing the benefits of fiber intake, Whole fruit consumption has been encouraged overfruit juice intake. Also this helps to increase the time over which same calories are being consumed whencompared to juice intake. Toddlers should not be given juice from bottles or easily transportable covered cups asthis facilitates more consumption as well as higher risk for dental caries. For the same reason bedtime juice intakeis not recommended. Consumption of unpasteurized juice products has been strongly discouraged across all agegroups due to risk of contamination by pathogen such as Escherichia coli, Salmonella species, and Cryptosporidiumspecies.

Energy drinks :

Energy drinks and sports drinks are other common beverages consumed, especially in adolescents. In February 2018 American College of Sports Medicine reinforced AAP recommendations for children and stated that energy drinks carry high risk of complications in children and adolescents and are not intended for children though adolescents were not mentioned about. Further, irrespective of health and fitness status, these drinks are not recommended before and after strenuous activity. They have advised people not to mix energy drinks with alcohol. The group once again stressed on International Council of Beverage Associations (ICBA) recommendations on prohibition of marketing these drinks in events involving children and adolescents.

In the latest report by the expert group on consumption of fat, sugar and salt and its ill health effects on Indian population by FSSAI in 2017, following recommendations were released.

1. Nutrition specific recommendations. These are based on NIN ICMR dietary guidelines (2010). The group recommends a balanced diet should provide around 60-70% of total calories from carbohydrate, 10-12% from protein and 20-30% of total calories from fat. SFAs levels should be <10% of total energy intake per day; PUFA 6-10%; TFAs must be <1%; MUFA by difference (about 5-8%). Foods prepared by partially hydrogenated vegetable oil, deep fried food and ultraprocessed food to be avoided. Sweetened beverages such as colas, packaged fruit juices, aerated drinks should be avoided. Added salt should be restricted to about 5- 6g per day.
2. Reliable Monitoring systems to assess FSS intake periodically to assess the actual intake of fast foods and thereby establish correct regulatory measures.
3. Ban on foods with high FSS advertising on children's channels or during children-shows as done In many other countries.
4. Imposition of additional tax on the purchase of ultraprocessed commodities and sugar sweetened beverages (SSB).
5. Nutrition education and awareness involving nutrition, agriculture, food industries, health and allied sectors. Awareness programs through public health campaigns, school education programs should be initiated.
6. Advocating voluntary reformulation of commercialized food products to reduce the contents of fats (i.e. saturated fats and trans fats), sugar (free sugars) and salt in packaged food.

7. Detailed nutritional labeling should be strictly adhered to by all food and beverage manufacturers.
8. Provide a nutrition-sensitive and an enabling environment to make healthier choices

Recommendations and policies in major countries are summarized in Table 1

Table 1: List of recommendations and regulations of major countries.

Country	Recommendations and Regulations
India	FSSAI regulations on Energy Drinks, and Caffeine Regulations on sale of HFSS food in and around school 2015
United States	HHFKA (2010) Nutrition Standards in the National School Voluntary "Facts Up Front" system by food industry Self-regulatory standards for food and beverage marketing SSB taxes in some cities Fruit juices 2017 and Energy drink guidelines 2011 by AAP
United Kingdom	Scientific Advisory Committee on Nutrition 2015 guidelines on Carbohy drates and Health Food Standards Agency (2017) guidelines on High caffeine 'energy' drinks and other foods containing caffeine Front of pack labeling guide
Australia	2010 National Healthy School Canteens guidelines Health star rating system for front-of pack labeling 2013 Australia New Zealand Food Standards Code Policy context relating to sugars in Australia and New Zealand 2017
New Zealand	Health star rating system for front-of-pack labeling system Restrictions on advertising of unhealthy food to children since 2008 Australia New Zealand Food Standards Code 2013 Policy context relating to sugars in Australia and New Zealand 2017
France	Prohibition on food marketing in schools Tax on SSBs (2012)
Netherlands	Voluntary food rules and recommendations for schools Ban on food advertising in kindergarten and primary school
Mexico	Ban on unhealthy foods in schools Front-of-package labeling Regulation of food and beverage marketing to children
Finland	Consumer Ombudsman's Guidelines on Marketing to Children
China	Guidelines on snacks for children and adolescents General Rules for Nutrition Labeling of Prepackaged Foods 2013
Canada	Regulations for all prepackaged foods to have nutrition labeling Guidelines for high caffeine beverages
Bangladesh	Infant and young children feeding policies
Hungary	Taxes on HFSS foods 2011
Chile	Food Labeling and Advertising law 2012 front-of-pack labeling
Brazil	National Food and Nutrition Policy Regulations for food marketing to infants and young children

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Recent Changes in WHO Recommendations of Rabies Prevention

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Rabies is still endemic in many parts of the world. Approximately 40% of cases ae in children aged below 15 years. Rabies is a viral zoonotic disease. All mammals are susceptible to infection by the rabies virus (RABV). Transmission of RABV by dogs is responsible for up to 99% of human rabies cases in rabies-endemic regions. RABV infection in rodents is very uncommon. No human rabies cases due to bites by rodents have been reported.

There are no documented cases of human rabies resulting from consumption of raw meat from a rabid animal. Infectious RABV has never been isolated from milk of rabid cows and no documented case of human rabies has been attributed to consumption of raw milk.

Risk categories of rabies

The following categories describe the risk of a RABV exposure according to the type of contact with the animal suspected of having rabies. The category of exposure determines the indicated PEP procedure:

Category I :

Touching or feeding animals, animal licks on intact skin (no exposure);

Category II:

Nibbling of uncovered skin, minor scratches or abrasions without bleeding (exposure);

Category III:

Single or multiple transdermal bites or scratches, contamination of mucous membrane or broken skin with saliva from animal licks, exposures due to direct contact with bats (severe exposure).

Following an exposure, the first specific clinical symptom of rabies is usually a neuropathic pain at the site of bite or contact. The pain is caused by virus replication in the corre sponding dorsal root ganglia and inflammation induced by a cellular immune response. The highly neurotropic RABV replicates in muscle tissue and enters peripheral nerves, spreads by way of the peripheral nervous system to the spinal cord and ascends to the brain. On arrival in the brain, RABV replicates and disseminates rapidly, via the nervous system, to many different tissues of the body including the salivary glands.

WHO case definition for human rabies

A subject presenting with an acute neurological syndrome (encephalitis) dominated by forms of hyperactivity (furious rabies) or paralytic signs (paralytic rabies) progressing towards coma and death, usually by cardiac or respiratory failure, typically within 7–10 days after the first sign. Signs and symptoms of rabies include any of the following: hydrophobia, aerophobia, photo-phobia, paraesthesia or localized pain, dysphagia, local¬ized weakness, nausea or vomiting.

The human case classification for rabies is:

Suspected – A case that is compatible with a clinical case definition

Probable – A suspected case plus a reliable history of contact with a suspected, probable or confirmed rabid animal

Confirmed – A suspected or probable case that is laboratory-confirmed (usually post-mortem).

Prevention

Prevention of rabies depends to a large extent on the awareness of about the disease. Efforts to promote awareness should include education, engagement with relevant sectors on animal bite prevention, responsible dog ownership and prompt first aid after exposure. Prompt and proper wound cleaning and management remains the most

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important step towards prevention of RABV infection.

Rabies is a vaccine-preventable disease in both humans and animals. Mass dog vaccination aiming at 70% coverage in endemic areas interrupts RABV transmission at its animal source and saves human lives. Human rabies vaccination is primarily used for PEP and pre-exposure prophylaxis (PrEP) for populations at high risk of exposure.

WHO and its partners have endorsed a target of Zero Human Rabies Deaths from dog-transmitted rabies by 2030 (Zero by 30). This is aligned with Goal 3 of the Sustainable Development Goals, to end epidemics of communicable diseases including neglected tropical diseases by 2030.

Recent developments

Recent data indicate that PEP and PrEP regimens can be shortened in duration and number of doses required. Evidence on investigational ID and IM, PEP regimens was reviewed to assess their non-inferiority compared to current WHO recommended PEP regi¬mens.

Rabies immunoglobulins (RIG)

After exposure to rabies, RIG provides passive immunization by neutralizing RABV at the wound site before the immune system can respond to the vaccine by producing VNAs. Maximum infiltration of the RIG dose (calculated by body weight) into and around the wound is effective and that benefits from additional IM administration of any remaining RIG at a site distant to the wound are likely to be very limited. Remaining RIG may be given to other patients; this practice is particularly useful if RIG is in short supply.

Monoclonal antibody

A single monoclonal antibody (mAb) product against rabies, which was licensed in India in 2017, has been demonstrated to be safe and effective in clinical trials. This mAb neutralizes a broad panel of globally preva¬lent RABV isolates. The comparative advantages of mAb products include large-scale production with standardized quality, greater effectiveness than RIG, elimination of the use of animals in the production process, and reduction in the risk of adverse events.

For previously immunized individuals of all ages who have documented evidence of previous PrEP or at least 2 administrations of vaccine for PEP, RIG or mAb is not indicated.

Strategies of prevention

WHO recommends 2 main immunization strategies for the prevention of human rabies:

Post-exposure prophylaxis (PEP):

It includes extensive and thorough wound washing at the RABV-exposure site, together with RIG administration if indicated and the adminis¬tration of a course of several doses of rabies vaccine;

Pre-exposure prophylaxis (PrEP):

It is the administration of several doses of rabies vaccine before exposure to RABV.

For all age groups ID injection sites are the deltoid region and either the anterolateral thigh or suprascap¬ular regions. The recommended site for IM administra¬tion is the deltoid area of the arm for adults and chil¬dren aged =2 years, and the anterolateral area of the thigh for children aged <2 years. Rabies vaccine should not be administered IM in the gluteal area.

Post-exposure prophylaxis (PEP)

The indication and procedure for PEP depend on the type of contact with the suspected rabid animal and immunization status of the patient. For category I expo¬sures, no PEP is required. For category II, immediate vaccination is recommended. For category III, immedi¬ate vaccination is recommended and administration of RIG, if indicated.

The first dose of rabies vaccine should be administered as soon as possible after exposure. Vaccine should always be administered when a category III exposure is recognized, even months or years after the contact. However, the likelihood of developing clinical rabies declines progressively during the 12 months after the exposure with clinical rabies occurring only rarely after 12 months.

If an individual has a repeat exposure <3 months after a previous exposure, and has already received a complete PEP, only wound treatment is required; neither vaccine nor RIG is needed. For repeat exposures occurring >3 months after the last PEP, the PEP schedule for previously immunized individuals should be followed; RIG is not indicated. Table 1 shows the PEP in category wise exposure.

Pre-exposure prophylaxis (PrEP)

WHO recommends the following PrEP schedule: 2-site ID vaccine administered on days 0 and 7. If IM admin¬istration is used, WHO recommends a 1-site IM vaccine administration on days 0 and 7.

Table 1. Post-exposure prophylaxis (PEP) by category of exposure

Category I exposure	Category II exposure	Category III exposure	
Immunologically naive individuals of all age groups	Washing of exposed skin surfaces: No PEP required	Wound washing and immediate vaccination: • 2-sites ID on days 0, 3 and 7 • 1-site IM on days 0, 3, 7 and between day 14–28 • 2-sites IM on days 0 and 1-site IM on days 7, 21 RIG is not indicated.	Wound washing and immediate vaccination • 2-sites ID on days 0, 3 and 7 or • 1-site IM on days 0, 3,7 and between day 14–28 or • 2-sites IM on days 0 and 1-site IM on days 7, 21 RIG administration is recommended.
Previously immunized individuals of all age groups	Washing of exposed skin surfaces No PEP required.	Wound washing and immediate vaccination • 1-site ID on days 0 and 3 or • At 4-sites ID on day 0 or • At 1-site IM on days 0 and 3 RIG is not indicated.	Wound washing and immediate vaccination • 1-site ID on days 0 and 3 or • At 4-sites ID on day 0 or • At 1-site IM on days 0 and 3 RIG is not indicated.

Further reading :

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Evidence Update

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This issue's Evidence Update includes 3 meta-analyses, one large prospective cohort study and 2 RCTS. The topics are relevant to our day to day practice. The evidence from these studies confirms the utility of a single prophylactic dose of theophylline for preventing AKI in asphyxiated neonates; and of human milk as protective for bronchopulmonary dysplasia in preterm infants. Both these interventions should therefore be used wherever feasible.

While most international guidelines are already preferring PEG 3350 over lactulose in the management of childhood functional constipation, the current meta-analyses includes children < 2 years and confirms benefit even in this age group.

ADHD and inattentivity are documented as long term risks of extreme prematurity, even after accounting for confounding factors such as genetics, environment and sex.

More evidence is required before universally advocating intrapulmonary administration of steroids in preterm infants with respiratory distress syndrome.

Finally, in our country, where availability of drug levels is scarce, continuous infusion of vancomycin may yield better therapeutic levels than the standard intermittent dosing, however further studies on clinical outcome are needed.

(1) Theophylline and aminophylline for prevention of acute kidney injury in neonates and children: a systematic review

Bhatt GC, Gogia P, Bitzan M, Das RR. Arch Dis Child. 2019 Feb 23. [Epub ahead of print].

Summary

The occurrence of Acute Kidney Injury(AKI)in NICU and PICU patients, is associated with increased mortality, longer hospital stay and increased expenditure. This systemic review and meta-analysis,pooled results of 9 RCTs and quasi-RCTs(1970-2018) to assess the efficacy and safety of theophylline and aminophylline in prevention of AKI in neonates and children.

Six trials (436 participants) assessed the renoprotective role of one dose of prophylactic theophylline vs. placebo- in term asphyxiated neonates. The pooled estimate showed a 60% reduction in the incidence of AKI, significant decrease in serum creatinine over days 2–5, with a non-significant difference in all-cause mortality (5 trials, 356 patients). A significant difference in the negative fluid balance (4 trials), increase in GFR and decrease in urinary ß2 microglobulin (3 trials) was seen in favour of theophylline. The rate of complications was not different between groups. A single dose of aminophylline also improved AKI markers in preterm infants with perinatal asphyxia (1 trial, 22 patients).

Single trials for (a) prophylactic theophylline in preterm infants with respiratory distress syndrome (b) aminophylline for children undergoing cardiac surgery, did not reveal any benefit over placebo.

The review concludes that single dose of prophylactic theophylline (given in dose of 5mg/kg in four trials and 8 mg/kg in two trials) to neonates with severe birth asphyxia is beneficial for improving AKI parameters, without causing significant adverse effects. However the quality of evidence is moderate to very low and further trials are required, particularly in infants being treated with therapeutic hypothermia, which is the state of art management.

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Comments

Neonatal AKI is largely dependent on management by supportive measures, since dialysis though not impossible, is difficult in infants, particularly in those with multiple comorbidities. Adenosine acts as an intrarenal vasoconstrictor after exposure to hypoxia, causing fall in GFR. The estimated reduction in the occurrence of AKI by 60% after a single dose of theophyllineispromising,given the ease of the intervention, and low adverse effect rates. The modest transient increase in diuresis and negative fluid balance associated with theophylline may be beneficial in providing fluid therapy, drugs and nutrition. However, till date, the benefit seems to be limited to infants with severe perinatal asphyxia. It will be interesting to see if further trials can demonstrate benefit in other AKI risk conditions. This review also excluded the sickest babies requiring ventilator support in whom the outcomes maybe very different. Lastly, follow-up data beyond the neonatal period has not been provided.

(2) Human milk as a protective factor for bronchopulmonary dysplasia: a systematic review and meta-analysis

Huang J, Zhang L, Tang J, Shi J, Qu Y, Xiong T, Mu D.Arch Dis Child Fetal Neonatal Ed. 2019 Mar;104(2):F128-F136.

Summary

This is a meta-analysis of published studies (1986 to 2017) evaluating the effects of human milk on the risk of bronchopulmonary dysplasia (BPD) in preterm infants. Included were 17 cohort studies and 5 RCTs; n= 8661, from multiple countries of wide geographical range. Preterm infants were divided according to feeding type into six groups- (i) exclusive human milk (100% human milk), (ii) exclusive formula (100% formula feeding), (iii)mainly human milk (50%=human milk feeding<100%),(iv) mainly formula (50%=formula feeding<100%), (v) any human milk (0<human milk feeding=100%) and (vi) any formula feeding (0<formula feeding=100%). Infants were diagnosed to have BPD by their oxygen dependency at = 28 days of life or 36 weeks postmenstrual age whichever is later. Occurrence of BPD in human milk feeding group vs. formula feeding group were analyzed in Forest plots and expressed using odds ratio(OR) and 95% confident interval (CI). The results i.e. occurrence of BPD in preterm infant noted as ORin each comparative group were:

(A) 0.78 fold with exclusive human milk group compared with exclusive formula (95% CI = 0.68 to 0.88).

(B) 0.77 fold with exclusive human milk compared with mainly formula (0.68 to 0.87).

(C) 0.76 fold with exclusive human milk compared with any formula (0.68to 0.87)

(D) 0.78 fold with the mainly human milk compared with exclusive formula (0.68 to 0.88)

(E) 0.83 fold with the mainly human milk compared with mainly formula (0.69 to 0.99).

(F) 0.82 fold with any human milk compared with exclusive formula (0.73 to 0.93).

All the comparison analyses showed that both exclusive human milk feeding and partial human milk feeding appears to be associated with lower risk of BPD in preterm infants. Though the RCTs had high risk of bias, the cohorts were high quality; hence results were not unduly influenced by a particular study as revealed in sensitivity analysis. The authors expressed need for more high quality RCTs in this topic.

Comments

BPD or chronic lung disease occurs in premature infants due to incomplete development of immature lung coupled with a variety of postnatal insults (oxidative stress from high inspired oxygen, ventilator induced lung injury, infections) lead to inflammation and abnormal lung repair). These infants are more likely to have persistent respiratory symptoms needing recurrent hospitalizations in first two years of life. With recent improved perinatal care, more premature infants are surviving; leading to increased absolute number of infants with this condition.

On the other hand, human milk has the anti-infective property (lactoferrin, peroxidases, lipases, lysozymes, macrophages, T and B lymphocytes, complements, secretory IgA) which protect infants from infections; the antioxidant components (tocopherol, carotene) alleviate oxidative stress; and

with the nutritive value (sometime needs fortification) it's the first choice for early enteral feeding in premature babies – all these are important in preventing BPD.

This meta-analysis showed the benefit of human milk in reducing BPD consistently in six comparison groups irrespective of the degrees of breast feeding. However, the positive results are mainly from cohort studies (high quality but observational), while RCTs (having some bias and small sample size) showed benefit but did not reach at the levels of statistical significance. Hence large RCTs are required to confirm these findings.

(3) Efficacy and safety of pulmonary application of corticosteroids in preterm infants with respiratorydistress syndrome: a systematic review and meta- analysis

Delara M, Chauhan BF, Le ML, Abou-Setta AM, Zarychanski R, 'tJong GW. Arch DisChild Fetal Neonatal Ed. 2019 Mar;104(2):F137-F144.

Summary

Bronchopulmonary dysplasia (BPD) is a common complication occurring in 50% of extremely preterm infants with RDS and one of the leading cause of morbidity and mortality in them. It is associated with neurodevelopmental impairment and respiratory problems later in life. Systemic steroids are used but associated with significant adverse effects on growth and neurodevelopment. It is possible that pulmonary administration of steroids may provide the same benefit without the adverse effects.

This systemic review and meta-analysis includes 12 RCTs (1992-2018) representing 1935 preterm infants with RDS. Pooled data compared inhaled or endotracheal corticosteroids administered at any postnatal age, dose, timing or frequency, with the standard of care, placebo or no other intervention in preterm infants with RDS.

The results showed that pulmonary corticosteroid therapy significantly reduces the composite outcome of BPD or death in preterm infants without major side effects in the short term [Relative Risk(RR) 0.85, 95% CI 0.74 TO 0.96], however death alone is unaffected. This benefit was greater when surfactant was used as a vehicle for intra-tracheal steroid instillation, and when the steroid used was budesonide. In addition there was a reduction in the incidence of PDA (RR 0.82, 95% CI 0.74 to 0.92) and pneumonia (RR 0.57, 95% CI 0.35 to 0.92) in the treatment group. There was no evidence of significant difference regarding risk of neurodevelopmental impairment or other side effects.

Comments

A meta-analysis (3 trials) of inhaled vs. systemic steroids found no difference in incidence of mortality and BPD, raising interest in the possibility of replacing systemic with intrapulmonary steroid administration in preterm infants with RDS. However, previous meta-analyses of inhaled steroids for prevention of BPD included smaller number of trials and failed to show benefit over placebo.

In contrast, this systemic review includes larger numbers of trials and patients and shows benefit in administering intrapulmonary steroids in comparison to control groups. However this benefit was primarily seen when steroids were administered using surfactant as a vehicle, presumably due to improved distribution of the drug within the lungs.

Most of the trials included only had a short duration of follow up (2-14 days). Only two trials reported neurological outcomes with 2-3 years of follow up, thus evaluation of long term adverse effects of corticosteroids was not adequate. Large RCTs with long term follow up are required to examine for adverse effects on neurodevelopment and growth. In addition whether there in any difference in effect in comparison to systemic steroids remains to be further examined.

(4) PEG 3350 Versus Lactulose for Treatment of Functional Constipation in Children: Randomized Study.

Jarzebicka D, Sieczkowska-Golub J, Kierkus J, Czubkowski P, Kowalczuk-KrystonM, Pelc M, Lebensztejn D, Korczowski B, Socha P, Oracz G. J Pediatr Gastroenterol Nutr. 2019 Mar;68(3):318-324.

Summary

This is a randomized, open label, multicentric study performed between November 2015 and April 2017 with the aim to compare the clinical efficacy and tolerance of polyethylene glycol 3350 (PEG) and

lactulose for the treatment of functional constipation in infants and children. Prior trials had excluded children below 2 years of age.

Children aged 6 months to 6 years were included and the diagnosis of functional constipation was as per Rome III criteria. Newly diagnosed as well as children who were previously treated ineffectively were included in the study. Children with organic causes of constipation were excluded. Patients were randomized (central randomization) to receive either PEG or lactulose. The primary end points were the number of defecations per week after 12 weeks of treatment and improvement in stool consistency of at least 2 points in the Bristol scale. The secondary end point was the presence of adverse events. Bowel movements =3 per week and stool consistency =2 (Bristol scale) were considered as good clinical outcome and markers of efficacy.

102 children were enrolled of which 14 dropped out. Analysis at 12 weeks showed good clinical outcome in 98% of those treated with PEG and 90% of those treated with lactulose (statistically non-significant). However, the PEG group had more defecations per week as compared with the lactulose group (7.9?±?0.6 vs. 5.7?±?0.5, p?=?0.008). Other symptoms were similar in both groups. There were more patients with side effects in the lactulose group (15 vs. 23, P?=?0.02), mostly bloating and abdominal pain. The authors concluded that PEG 3350 is more effective and causes fewer side effects than lactulose in the treatment of constipation in infants and children.

Comments

Childhood constipation is a common problem comprising 3% of visits to general pediatricians and 30% of visits to pediatric gastroenterologists. In 17% to 40% of children, constipation starts in the first year of life. This study is one the few to compare the efficacy and adverse effects of PEG 3350 and lactulose in infants and toddlers. The study used ROME III criteria as Rome IV criteria was published in 2016 after the onset of this study. The study fails to document the minimum period at which the improvement in bowel movement and stool consistency occurred; does not comment on compliance issues, neither does it note the effects of treatment on bleeding per rectum. In cases where there was lack of clinical improvement at 4 weeks after PEG 3350 a change of dose was advised whereas similar change was not done in the group treated with lactulose and such patients were offered a change of treatment to PEG 3350. Dietary recommendations and daily defaecation training had been provided at enrolment but the authors did not mention whether these recommendations had been followed and hence if this confounds the results remains unknown. The authors mention that this study did not blind the patients and clinicians as it is technically difficult to administer PEG and lactulose in the same form. Lastly, this study has been performed in Poland, more studies are required to include other ethnicities especially that of the Indian subcontinent.

(5) Association of Gestational Age at Birth With Symptoms of Attention-Deficit/Hyperactivity Disorder in Children

Ask H, Gustavson K, Ystrom E, Havdahl KA, Tesli M, Askeland RB,Reichborn-Kjennerud T. JAMA Pediatr. 2018 Aug 1;172(8):749-756.

Summary

An association between attention deficit / hyperactivity disorder (ADHD) and preterm birth has been previously described in a meta-analysis. However, such risk may be confounded by family genetics and environment, sex (ADHD is known to be more common in boys) and degree of prematurity. This prospective nationwide cohort study was designed to explore:

(1) if family genetics and environment plays a role

(2) whether gestational age correlates with degree of symptoms

(3) whether of the 2 core ADHD symptoms, inattention or hyperactivity/ impulsivity, any one is more affected

(4) if there was a difference in prevalence according to sex.

Pregnant women were recruited from across Norway between Oct 2017 and March 2018. A total of 113227 children (55187 female) were included. Questionnaire based documentation of gestational and pregnancy details, ultrasound confirmation of gestational age and maternal reporting of symptoms

utilizing standard scales of ADHD at 5 years and inattention, hyperactivity/impulsivity at 8 years were recorded. Analyses compared children born at different gestations and of different sex. Sibling comparison approach was used to adjust for confounding factors of genetics and environment.

The results showed:

(1) Children born early preterm had higher scores vs. those born at 40 weeks of gestation: ORs were 1.55 (95%CI, 1.29-1.85) for ADHD at 5 years of age, 1.85 (95% CI, 1.55-2.14) for inattention at 8 years of age, and 1.52 (95%CI, 1.29-1.79) for hyper-activity at 8 years of age.

(2) Compared with their siblings born in gestational week 40 and adjusted for pregnancy-specific factors, early preterms had ORs of 1.79 (95% CI, 1.04-3.08) on ADHD at 5 years of age, 1.75 (95% CI, 1.09-2.81) on inattention at 8 years of age, and 0.95 (95%CI,0.21-1.60) on hyperactivity at 8 years of age.

(3) A dose response association between gestational age and ADHD score was found in girls but not in boysat 5 years

The authors conclude that after taking into account genetic and environmental factors, early preterm births were associated with a higher level of ADHD symptoms in pre-school children. Early preterm birth was associated with inattentive symptoms but not hyperactivity in 8 year old children. The pre-school association was found more pronounced for girls. There was significant confounding by factors shared between siblings. There was no correlation of being born in gestational weeks 34 to 39 and also the negative association of being born late term was attenuated in the sibling control models.

Comments

It is already established that there exists a relationship between lower gestational age and ADHD. The current study focuses on whether other factors are contributory and if gestational age is similarly related to inattention and hyperactivity/ impulsivity and to the same extent in boys and girls. The major strength of this study is the sibling control design.

However the authors themselves state that mothers who are smokers or under-educated have been under-represented in the study which is a limitation. Other potential confounding factors like socio-economic status, peri-natal risk factors, psychosocial factors, peer relationships etc. have not been adequately addressed. The current study has significant attrition which can contribute to significant bias.

In addition, only 41% of the population approached agreed to participate which may also be source of bias. Acquired causes like traumatic brain injury, other major illnesses and under-nutrition are known confounding factors and have not been dealt with adequately in the current study. The incidence of ADHD appears increased in children with neurological conditions like epilepsies, neurofibromatosis, tuberous sclerosis and that consideration is not clear from this study

A more representative and stratified study is required to study the association of multiple factors with ADHD in addition to gestational age.

(6) Continuous Versus Intermittent Vancomycin Infusions in Infants:A Randomized Controlled Trial

Gwee A, Cranswick N, McMullan B, Perkins E, Bolisetty S, Gardiner K, Daley A,Ward M, Chiletti R, Donath S, Hunt R,Curtis N. Pediatrics 2019Feb;143(2) [Epub ahead of print].

Summary

Sepsis is a leading cause of death in young infants worldwide. In industrialized countries, infection with Gram-positive bacteria, particularly coagulase-negative staphylococci (CONS) and Staphylococcus aureus, are among the most common pathogens causing late-onset sepsis. As a result, vancomycin, a glycopeptide antibiotic, is often used in the treatment of young infants with suspected or proven sepsis, particularly in the hospital setting.

Vancomycin is routinely administered as intermittent infusions multiple times per day (IIV). Studies reveal that these current dosing recommendations result in poor attainment of target vancomycin levels. Continuous infusions of vancomycin(CIV) are an attractive alternative to IIV in young infants.

This was a multicenter, nonblinded, RCT conducted over a 40-month period (September 2014–December 2017). In total, 111 young infants, <90

days age, were randomly assigned, 54 to IIV and 57 to CIV, of whom 51 and 53, respectively, were included in the final intention-to-treat analysis. The proportion of infants who achieved target concentrations at the ?rst steady-state level was 21 of 51(41%) in the IIV group compared with 45 of 53 (85%) in the CIV group (p= .001).

Overall, 43 of 51 (84%) infants in the IIV group achieved target levels by the end of the study period compared with 51 of 53 (97%) infants in the CIV group (p = .04). The mean time to achieve the target concentration was greater for the IIV (33.6 hour s; SD 38.8 hours) compared with the CIV group (27.1 hours; SD 10.8 hours; p = . 003)

This is the ?rst RCT of vancomycin dosing in a pediatric population. The study showed that, in young infants compared with IIV, CIV results in earlier and improved attainment of target levels, requires only 1 dose adjustment, and lower total daily doses to achieve therapeutic levels. Vancomycin-related drug toxicity and adverse effects were rare with both CIV and IIV.

Comments

This is the first RCT of vancomycin dosing in a pediatric population. In this study current IIV dosing regimen was found to be at sub-therapeutic level in majority of infants. CIV demonstrated improved attainment of target vancomycin levels, required only one dose adjustment and lower total daily doses to achieve therapeutic concentrations.

In India, the availability of vancomycin blood levels is rare and therefore in the majority of cases the drug is used without such guidance. Yet there are several significant indications for the use of this drug and most patients who require it are fairly ill. Therefore the better method of delivery, to ensure attainment of the therapeutic drug levels appears to be by CIV rather than IIV.

However potential disadvantages of CIV include risk of drug incompatibilities and reduced line availability. One limitation of the study was that it was not powered to detect vancomycin related nephrotoxicity or infection related mortality as these events are infrequent.

There is a need for more future studies which focus on impact of CIV compared with IIV on clinical outcomes of gram positive infections, particularly in developing countries where facilities for pharmacokinetic drug monitoring are not easily available.

Universal Health Coverage

Compiled from various resources by
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Universal Health Coverage

UHC, as defined by World Health Organization, means that all individuals and communities receive the health services they need without suffering financial hardship. It includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care. UHC enables everyone to access the services that address the most significant causes of disease and death, and ensures that the quality of those services is good enough to improve the health of the people who receive them. Achieving UHC is one of the targets the nations of the world set when adopting the Sustainable Development Goals in 2015. Countries that progress towards UHC will make progress towards the other health-related targets, and towards the other goals. Good health allows children to learn and adults to earn, helps people escape from poverty, and provides the basis for long-term economic development. Many countries are already making progress towards UHC. All countries can take actions to move more rapidly towards it, or to maintain the gains they have already made. In countries where health services have traditionally been accessible and affordable, governments are finding it increasingly difficult to respond to the ever-growing health needs of the populations and the increasing costs of health services.

Moving towards UHC requires strengthening health systems in all countries. Robust financing structures are key. When people have to pay most of the cost for health services out of their own pockets, the poor are often unable to obtain many of the services they need, and even the rich may be exposed to financial hardship in the event of severe or long-term illness. Pooling funds from compulsory funding sources (such as mandatory insurance contributions) can spread the financial risks of illness across a population.

Improving health service coverage and health outcomes depends on the availability, accessibility, and capacity of health workers to deliver quality people-centred integrated care. Investments in quality primary health care will be the cornerstone for achieving UHC around the world. Investing in the primary health care workforce is the most cost-effective way to ensure access to essential health care will improve. Good governance, sound systems of procurement and supply of medicines and health technologies and well-functioning health information systems are other critical elements.

Primary health care is the most efficient and cost effective way to achieve universal health coverage around the world.

To meet the health workforce requirements of the Sustainable Development Goals and universal health coverage targets, over 18 million additional health workers are needed by 2030. Gaps in the supply of and demand for health workers are concentrated in low- and lower-middle-income countries. The growing demand for health workers is projected to add an estimated 40 million health sector jobs to the global economy by 2030. Investments are needed from both public and private sectors in health worker education, as well as in the creation and filling of funded positions in the health sector and the health economy.

UHC emphasizes not only what services are covered, but also how they are funded, managed, and delivered. A fundamental shift in service delivery

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is needed such that services are integrated and focused on the needs of people and communities. This includes reorienting health services to ensure that care is provided in the most appropriate setting, with the right balance between out- and in-patient care and strengthening the coordination of care. Health services, including traditional and complementary medicine services, organized around the comprehensive needs and expectations of people and communities will help empower them to take a more active role in their health and health system.

Monitoring progress towards UHC should focus on 2 things:

- The proportion of a population that can access essential quality health services.
- The proportion of the population that spends a large amount of household income on health.

WHO uses 16 essential health services in 4 categories as indicators of the level and equity of coverage in countries:

Reproductive, maternal, newborn and child health:

- family planning
- antenatal and delivery care
- full child immunization
- health-seeking behaviour for pneumonia.

Infectious diseases:

- tuberculosis treatment
- HIV antiretroviral treatment
- Hepatitis treatment
- use of insecticide-treated bed nets for malaria prevention
- adequate sanitation.

Noncommunicable diseases:

- prevention and treatment of raised blood pressure
- prevention and treatment of raised blood glucose
- cervical cancer screening
- tobacco (non-)smoking.

Service capacity and access:

- basic hospital access
- health worker density
- access to essential medicines

There are many things that are not included in the scope of UHC:

- UHC does not mean free coverage for all possible health interventions, regardless of the cost, as no country can provide all services free of charge on a sustainable basis.
- UHC is not just about health financing. It encompasses all components of the health system: health service delivery systems, the health workforce, health facilities and communications networks, health technologies, information systems, quality assurance mechanisms, and governance and legislation.
- UHC is not only about ensuring a minimum package of health services, but also about ensuring a progressive expansion of coverage of health services and financial protection as more resources become available.
- UHC is not only about individual treatment services, but also includes population-based services such as public health campaigns, adding fluoride to water, controlling mosquito breeding grounds, and so on.

UHC is comprised of much more than just health; taking steps towards UHC means steps towards equity, development priorities, and social inclusion and cohesion.

Universal Health Coverage in India ensures equitable access for all Indian citizens, resident in any part of the country,regardless of income level, social status, gender, caste or religion, to affordable, accountable, appropriate health services of assured quality (promotive, preventive, curative and rehabilitative) as well as public health services addressing the wider determinants of health delivered to individuals and populations, with the government being the guarantor and enabler, although not necessarily the only provider, of health and related services.

Ten principles have guided the formulation of UHC in India:

1. Universality
2. Equity
3. Non-exclusion and non-discrimination

4. Comprehensive care that is rational and of good quality
5. Financial protection
6. Protection of patients' rights that guarantee appropriateness of care, patient choice, portability and continuity of care.
7. Consolidated and strengthened public health provisioning
8. Accountability and transparency
9. Community participation
10. Putting health in people's hands.

Healthy India, Prosperous India', has been well reflected in the 2018-19 budget.Under the over-arching 'Ayushman Bharat' programme, aimed at addressing health holistically, in primary, secondary and tertiary care system, covering both prevention and health promotion,the government is steadily but surely progressing towards the goal of Universal Health Coverage.Universal Health Coverage (UHC) is a flagship programme of the WHO in the South-East Asia Region, and is now a global priority. WHO welcomed India's announcement of Rs 52,800 crore health budget and commends the schemes and initiatives planned to holistically address health. India's initiatives are well timed with WHO's initiative to strengthen efforts to make universal health coverage a reality. The National Health Protection Scheme, a promising programme will cover over 10 crore poor and vulnerable families (approximately 50 crore beneficiaries) providing coverage up to Rs 5 lakh per family per year for secondary and tertiary hospitalization. The timely implementation of the scheme will be the cornerstone of a successful rollout.

The other major initiative is making Health and Wellness Centres as the foundation of India's health system. These 1.5 lakh centres will bring the health care system closer to the homes of people, providing comprehensive care, including noncommunicable diseases and maternal and child health services. The government centres will provide free essential drugs and diagnostic services. Rs 1200 crores has been allocated for this flagship programme.

Ayushman Bharat Yojana or Pradhan Mantri Jan Arogya Yojana (PMJAY) or National Health Protection Scheme or ModiCareis a centrally sponsored scheme launched in 2018, under the Ayushman Bharat Mission of MoHFW in India. The scheme aims at making interventions in primary, secondary and tertiary care systems, covering both preventive and promotive health, to address healthcare holistically.[2] It is an umbrella of two major health initiatives namely, Health and Wellness centres and National Health Protection Scheme (NHPS).

Ayushman Bharat consists of two major elements.

1. National Health Protection Scheme

- Ayushman Bharat-National Health Protection Scheme, which will cover over 10 crore (one hundred million) poor and vulnerable families (approximately 50 crore (five hundred million) beneficiaries) providing coverage up to 5 lakh rupees ($7,100) per family per year for secondary and tertiary care hospitalization.
- Benefits of the scheme are portable across the country and a beneficiary covered under the scheme will be allowed to take cashless benefits from any public or private empaneled hospitals across the country.
- It will be an entitlement based scheme with entitlement decided on the basis of deprivation criteria in the SECC database. It will target about 10.74 crore poor, deprived rural families and identified occupational category of urban workers' families as per the latest Socio-Economic Caste Census (SECC) data covering both rural and urban.
- One of the core principles of Ayushman Bharat - National Health Protection Mission is to co-operative federalism and flexibility to states.
- For giving policy directions and fostering coordination between Centre and States, it is proposed to set up Ayushman Bharat National Health Protection Mission Council (AB-NHPMC) at apex level Chaired by Union Health and Family Welfare Minister. States would need to have State Health Agency (SHA) to implement the scheme.
- Covering almost all secondary and many tertiary hospitalizations.

2. Wellness centres

Rs 1200 crore ($170 million) have been allocated

for 1.5 lakh (150,000) health and wellness centres,Under this 1.5 lakh centres will be setup to provide comprehensive health care,including for non-communicable diseases and maternal and child health services, apart from free essential drugs and diagnostic services. The list of Services to be provided at Health & Wellness Centre include:

- Pregnancy care and maternal health services
- Neonatal and infant health services
- Child health
- Chronic communicable diseases
- Non-communicable diseases
- Management of mental illness
- Dental care
- Geriatric care Emergency medicine

Reference :

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3. WHO SEARO.Available at http://www.searo.who.int/india/topics/universal_health_coverage/Path_to_UHC/en/. Accessed on 27th March 2019
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Short Stature Approach

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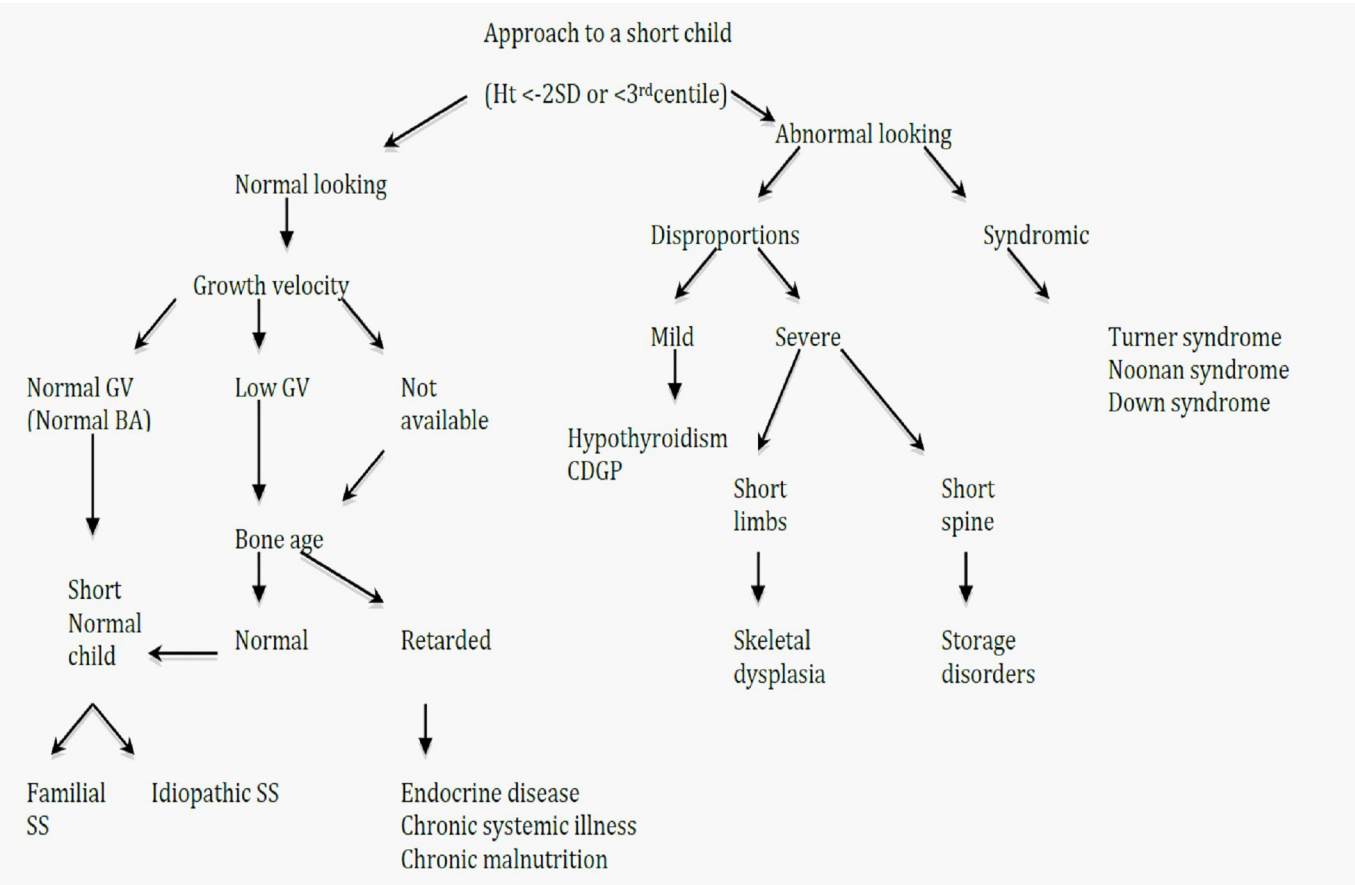

Neonatal Thyroid Screening Protocol

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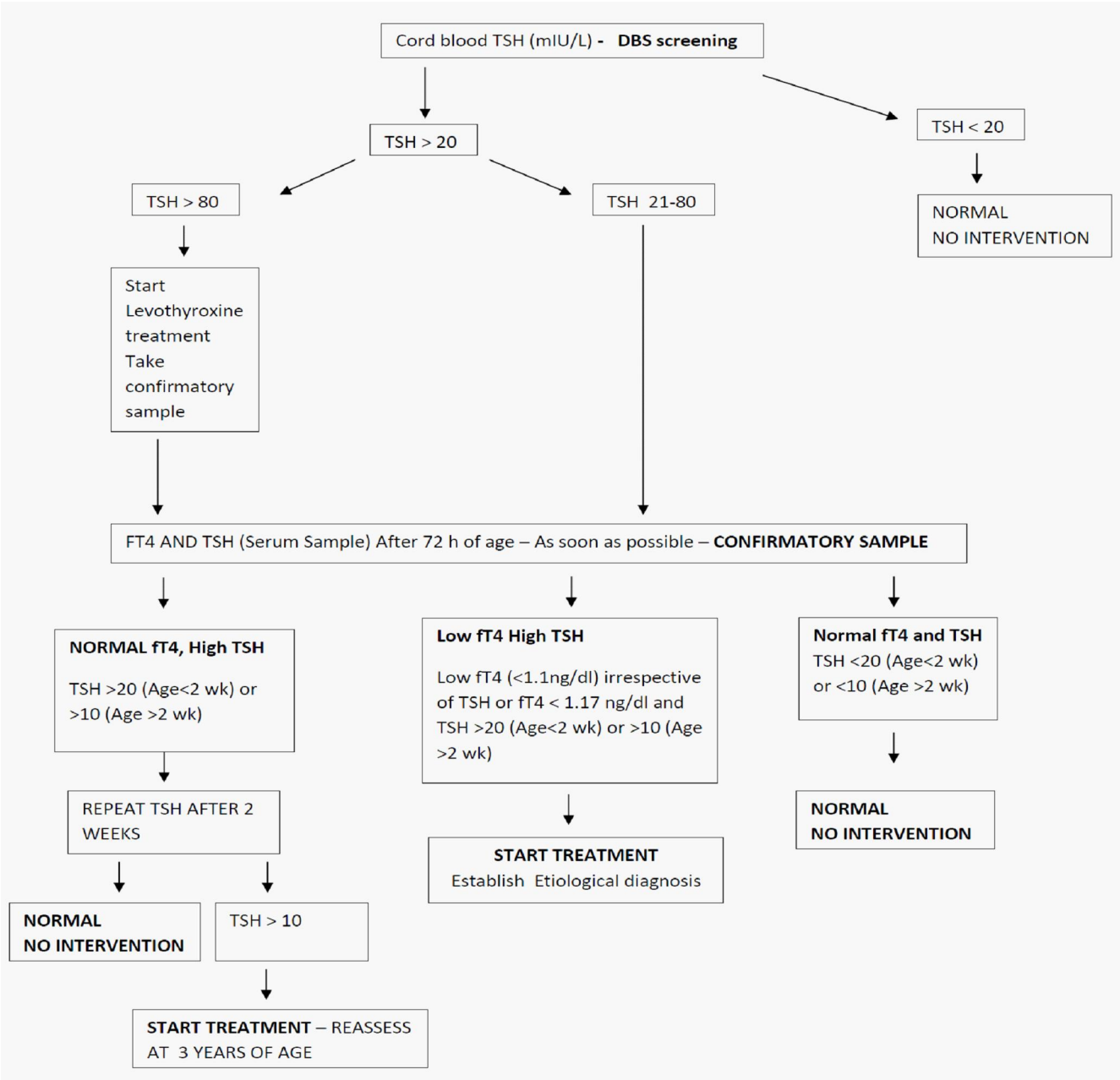

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Follow up and treatment Guidelines: