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Analysis of Co-morbidities in Children with Severe Acute Malnutrition in Eastern Region of Nepal.

Congenital Heart Defects

CEFDINER

We prioritize the little one with quality healthcare.
Pollution responsible for quarter of deaths of young children

A polluted environment is a deadly one, particularly for young children. According to reports formulated by WHO, pollution is responsible for one in four deaths among all children under five; with toxic air, unsafe water and lack of sanitation being the leading cause. Each year 1.7 million under fives are dying due to polluted environment. As stated in report, their developing organs and immune systems, and smaller bodies and airways; make them especially vulnerable to dirty air and water. The harm from air pollution can begin in the womb and increase the risk of premature birth. After birth, air pollution raises the risk of pneumonia, a major cause of death for under fives, and of lifelong conditions such as asthma. It may also increase the risk of heart disease, stroke and cancer in later life. In May 2016, WHO announced that air pollution around the world is rising at an alarming rate, with virtually all cities in poorer nations blighted by unhealthy air. And we all know that Nepal continues to rank among the worst performers in protecting the human health and environment due to degrading air quality. So, it has been the serious issue now we have to pay attention to prevent next generation from getting diseases. Not only this, most Nepalese children are also suffering from malnutrition, the bitter truth we all know. If we do not pay good attention in time to minimize the polluted environment, such as quality of air, water and sanitation, it will be cause for the children to get birth as they have to suffer from different diseases by birth. So, as action speaks louder than noise, I request for the action from each to minimize the pollution; rather than pointing towards government only.

In this issue, we are supported with articles related to pediatrics, raising the issues related to malnutrition and congenital birth defects. Besides this, it also includes the articles related to prostate cancer, pulmonary rehabilitation and many more. We always feel honored to share the information from our valued doctors with our readers. I thankfully acknowledge all medical fraternities for your continuous support to our MEDITIME, and wish similar support with valuable feedback and suggestions for improvement in it.

Lastly, I wish you all a very Happy New Year 2074 and request you to make New Year resolution to contribute in making healthier environment.
Breathing Bad Air

“Kanto dhoi” (So dusty) is a common phrase that most of us utter and hear all the time. The air we breathe is polluted and along with the pollution of the air we inhale, we are exposed to different health problems. According to World Health Organization (WHO), “Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere.”

The polluted air we breathe has an impact on incidences of allergies. It could lead to both skin allergies and eye allergies. “Those are likely to appear when people are exposed to polluted air. Burning and irritation in the eyes are quite common,” adds Dr. Bhulal, Consultant Physician at Green City Hospital.

Not only allergies but their are chances for one to suffer from psychological effects too when one is exposed either for a brief moment or for a long time to polluted air. “People are likely to experience anger, anxiety, irritation, headache,” reveals Dr. Bhulal. They are also likely to suffer from chronic anxiety if they are exposed to the polluted air for a long time. As polluted air comprises of nitrogen dioxide, those who often come in exposure to such air are at a high risk of suffering from respiratory and cardiovascular diseases.

Exposure to air pollution can lead to respiratory infections in children including childhood asthma. The WHO, in its website (www.who.int) adds, acute lower respiratory infections, in particular pneumonia, continue to be the biggest killer of young children and this toll almost exclusively falls on children in developing countries.

Air pollution has adverse effects on growing children as well. Pollution is likely to make an impact on the development and functioning of the lungs of children, as per Dr. Bhulal. People, who walk on the roads, work in dusty environment, ride motorcycles are more prone to the health problems caused by air pollution. In addition to these, people with a weakened immune system are also more prone to get affected. Neonates and the elderly should be given much care and attention,” informs Dr. Bhulal.

People living in city areas too are under bigger risk to suffer from air pollution effects. The use of face masks is an option to protect oneself. Vaccines for influenza and pneumonia are also helpful. So as to decrease air pollution in the Capital, Dr. Bhulal suggests, “Air pollution should be monitored and controlled. There should be a good coordination between the concerned departments of the government regarding the construction and development works so that pollution of the air can be controlled.”

Bird flu in poultry farm in Pokhara alarms officials

The H5N1 influenza virus has been detected in a poultry farm in Pokhara-18, Kaski, raising alarm bells of a possible outbreak. The bird flu virus was first detected in a male poultry farmer in the poultry farm belonging to Mino Purwak of Khahemisa in Pokhara. The District Livestock Services Office (DLSO) confirmed the virus in the poultry farm after laboratory tests. Samples sent to the Regional Veterinary Laboratory after Purwak reported death of a duck on February 17, tested positive. Dr Kedar Bajrangi, chief of the laboratory, said the sample was later sent to the Central Veterinary Laboratory in Kathmandu for confirmation. At least 17 ducks and 11 chickens have died in the farm so far. The local administration has declared Khahemisa area “bird flu infected area”.

The District Bird Flu Control Coordination Committee has imposed a ban on the trade and transport of fowls and poultry products for 42 days. A rapid response team from Kathmandu, led by Dr Abadabih Jha, arrived in Pokhara on Saturday to eradicate infected fowls. Thangendra Prasad Aryal, information officer at the DLSO, said domesticated birds within 500 meters periphery of Khahemisa were being eradicated. “Monitoring and sample testing have been carried out in other parts of Pokhara as well. Authorities are on high alert,” he added. The H5N1 virus was detected in various poultry farms at Bhatukhancha, Simpan, Birauta and Siddibagar of Pokhara in January 2013.

Excess sugar linked to Alzheimer’s: Study finds a ‘tipping point’

There’s yet another reason to ditch the sweet stuff. Scientists have found Alzheimer’s disease could be caused by excess sugar. A new study has established a “tipping point” link between the blood sugar glucose and the disease, meaning people with high sugar diets could be at a greater risk of developing the degenerative neurological condition. About 70 per cent of the estimated 43,000 Australians with dementia have Alzheimer’s, and more than 240 new cases of dementia are diagnosed each day, according to Alzheimer’s Australia.

Research from the University of Bath found excess glucose damages a vital enzyme involved with inflammation response to the early stage of the disease. Abnormally high blood sugar levels, or hyperglycaemia, are a well-known characteristic of diabetes and obesity. Diabetes patients have an increased risk of developing Alzheimer’s, where abnormal proteins aggregate to form “plaques” and “tangles” in the brain.

It was already known that glucose and its breakdown products can damage proteins in cells through a reaction called glycation. But new scientists have unraveled the specific molecular link between glucose and Alzheimer’s disease.

Studying people both with and without Alzheimer’s, they found in the early stages of Alzheimer’s, the glucose damages an enzyme called HIF (hypobaric hypoxia inducible factor). HIF plays a role in immune response and insulin regulation, and glycation limits its powers. So researchers took a big step. They identified another “tipping point” reducing the risk of Alzheimer’s disease progression. As the disease progresses, the concentration of these two enzymes increases. Professor Jon Paris and Dan Elan, from the University of Bath’s department of biology and biochemistry, said: “We’ve shown that this enzyme is already modified by glucose in the brains of individuals at the early stages of Alzheimer’s disease.”
Analysis of Co-morbidities in Children with Severe Acute Malnutrition in Eastern Region of Nepal.

Dr. Anil Thapa  
MD Pediatrics & Adolescent Medicine,  
Consultant Pediatrician,  
Lifeline Institute of Health Science, Damak

Abstract

Introduction: Malnutrition is a common problem in developing countries and often associated with co-morbidities. The present study was undertaken with objectives to find out the co-morbidities in children with severe acute malnutrition (SAM).

Materials and Methods: This was a hospital based study carried in 77 children with SAM, diagnosed on the basis of WHO criteria. Results: The age group of children was 1-5 years (median age 23 months) with about 39% between 1-2 years. There were 38 males (49.3%). Low maternal education (60%), overcrowding (60%), lower-middle socioeconomic status (67%) were some of the predisposing factors observed. Pneumonia (51%), acute gastroenteritis (11%) and bacterial meningitis (8%) were common co-morbidities found. Associated abnormal laboratory parameters found were anemia (60%), leucocytosis (38%), hypalbuminemia (36%) and hypoproteinemia (31%). There was no mortality.

Conclusion: Presence of infections and biochemical abnormalities require urgent attention in SAM cases and appropriate treatment in hospital setting to improve their survival.

Introduction

Globally, more than one-third of under-five deaths are attributed to under nutrition and of these, 10% are severely malnourished. 1,2 To our concern, Nepal also shares this burden of malnutrition with its 29% under 5 children being underweight and 11% severely wasted.3 Due to lack of knowledge and health resources, malnutrition has been overlooked and most patients present at hospital with complications rather than malnutrition alone. The mortality rate of children with complicated severe acute malnutrition (SAM) in hospitalized set-up has remained high.2 Such high mortality has been attributed to co-morbidities such as infections and complications.4 There are very reports on co-morbidities in SAM,5,6 which has evaluated clinical and laboratory profile in these children especially from this region of the country. Therefore, we analyzed the presence of co-morbidities and complications in children with SAM so that appropriate treatment can be instituted promptly in order to improve their survival.

Patients and methods

This was a descriptive cross-sectional study carried out at Department of Pediatrics and Adolescent Medicine, B.P Koirala Institute of Health Sciences, Dharan, Nepal during February 2013 to January 2014. All Children of age 1 to 5 years were screened at admission for malnutrition using WHO criteria.7 Among them, children with Severe Acute Malnutrition (SAM) were enrolled in the study. SAM was defined by using WHO criteria.8 Children with suspected congenital malformation were excluded.

After admission, data were collected in a pre-tested questionnaire by interview technique. The parents of SAM children were informed about the study and each question was explained. The anthropometric parameters such as weight, height, and mid-arm circumference were recorded at admission using standard techniques.9 Weight was recorded with a weight scale having an accuracy of 50 g and crown to heal length in 1-2 years with infantometer and height using stadiometer in 2-5 years age group, with sensitivity of 0.1 cm. Mid-arm circumference was measured with non-stretch measuring tape with sensitivity of 0.1 cm.

A detailed physical and systemic examination was performed. The investigations included hemoglobin, total and differential white blood cell count, platelet count, blood glucose, serum protein, albumin, urea, creatinine, sodium, potassium, X-ray chest and tuberculin test. Urine microscopy and culture were done, wherever required. 7 The disease classifications were used as per standard criteria. The children were treated with WHO criteria and followed for complications during the stay.

Ethical issues: The study was started after the approval of Institutional Ethical Review Board. A written informed consent was obtained from each parent of study subjects. The participants had option to withdraw from the study anytime during their hospital stay.

Table 1: Co-morbidities in children with severe acute malnutrition (n=77)

<table>
<thead>
<tr>
<th>Type of disease</th>
<th>n (%)</th>
<th>Age groups</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia</td>
<td>39 (50.6)</td>
<td>12-23 months (n=30)</td>
<td>0.91</td>
</tr>
<tr>
<td>Acute gastroenteritis</td>
<td>10(13.5)</td>
<td>24-60 months (n=47)</td>
<td>0.25</td>
</tr>
<tr>
<td>Bacterial meningitis</td>
<td>08 (10.4)</td>
<td>12-23 months (n=30)</td>
<td>1.00</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>05 (6.5)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
<tr>
<td>Fetal alcohol</td>
<td>05 (6.5)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>05 (6.5)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
<tr>
<td>Kasheor</td>
<td>1.0 (1.3)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
<tr>
<td>Pyo-septic gomeralisterispyorrhea</td>
<td>02 (2.6)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>01 (1.3)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
<tr>
<td>Central poly</td>
<td>01 (1.3)</td>
<td>12-23 months (n=30)</td>
<td>0.55</td>
</tr>
</tbody>
</table>

* Chi-square test, n= number of cases

Statistical analysis

Data were analyzed with Statistical Package for Social Sciences (SPSS) version 20 (Chicago IL). Chi-square test was used to test the significance level for the data of proportions; with Yates correction when sample size was less than five. A p value of < 0.05 was considered as significant.

Results

There were 446 children admitted in the hospital during the study period; of these 188(42.2%) were malnourished as per WHO criteria. 7 Among them 77 (17.2%) were diagnosed as SAM. Out of the 188 malnourished children, 95 (85%) were wasted, 20 (10.6%) were stunted and 73(38.8%) children had both wasting and stunting.

Thirty children (38.9%) of the study population were between 1-2 years (17 males) and 47 (61%) in the age group of 2-5 years (21 males) female. Overall mean age of children with SAM was 23.2 months. Of 77 SAM cases, 71 (92.2%) had their weight for height below -2SD with no evidence of edema. The mean weight, height, mid-arm circumference were 8.7±1.6 Kg, (86.6±10.0 cm and 12.9±0.8 cm, respectively. The characteristics of children with SAM are presented in Table 1. Median age of mothers was 26 years with age of marriage at 19 years and they had shorter birth spacing (median 1.6 years). About 60% of mothers were either illiterate
or had basic education of primary school level. Around 87% families belonged to lower socio-economic status. Of whom, 46.7% had joint family, median number of family members was 6 and 64.9% were staying in overcrowding situation. About 78% of all children were fed with colostrum. The median period of exclusively breast feeding was 4 months. Nearly 90% children were completely immunized and the remaining 10% had partial immunization.

Pneumonia (50.6%) was the most common co-morbid illness with SAM followed by acute gastroenteritis (20.8%) and bacterial meningitis (7.8%). Children were sub-grouped between 1 to 24 months and 25-60 months, and it was found that there were no significant differences in distribution of illnesses between the two groups (Table 2).

The laboratory parameters are presented in Table 3. Anaemia, leucocytosis and leucopenia were observed in 59.7%, 37.7% and 7.8% of cases. Other abnormalities were hyponatremia (38.4%), hypoproteinemia (31.2%) and hypokalemia (16.9%). Impaired renal function was seen in 3 (3.9%) and another 3 (3.9%) children had associated urinary tract infection. None of the children had hypoglycaemia at presentation. There was no mortality in SAM children.

Table 2. Laboratory parameters in severe acute malnutrition (n=77)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaemia</td>
<td>24 (31.6%)</td>
</tr>
<tr>
<td>Leucocytosis</td>
<td>29 (37.7%)</td>
</tr>
<tr>
<td>Leucopenia</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>Anaemia (modified WBC)</td>
<td>19 (24.7%)</td>
</tr>
<tr>
<td>Hyponatremia (serum Na&lt;130 mg/dl)</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>Hypoproteinemia (serum albumin&lt;2.5 g/dl)</td>
<td>7 (9.1%)</td>
</tr>
<tr>
<td>Hypokalemia (serum K&gt;7.5 mg/dl)</td>
<td>12 (15.6%)</td>
</tr>
<tr>
<td>Renal uric acid (&gt;75 mg/dl)</td>
<td>6 (7.8%)</td>
</tr>
<tr>
<td>Urine culture positivity</td>
<td>1 (1.3%)</td>
</tr>
</tbody>
</table>

Discussion

It appears that malnutrition is still a common problem in developing country like ours so much so that about 17% of children belonged to SAM and about 92% had weight for height less than 3 SD. Global prevalence of 16.1% was reported by Casie et al. 5 In contrast, a study from South-East Nigeria reported lower incidence (4.4%) of SAM in their 616 children. 6 Relatively higher incidence of SAM in the present study could be because of multifactorial in origin such as younger age of mother and lower educational status not having enough awareness regarding feeding practices, lower socioeconomic status, lesser duration of exclusive and total breast feeding than recommended. Keerthivasan et al. 10 found significant association of lower maternal education, lower paternal education, low family income and mother being a housewife in children with SAM. The gender distribution of cases was almost equal. The median age of children was 23 months, which was higher than the figure (14.3 months) reported by Kumar et al. 11 Further, authors also found that 75.8% of their SAM cases had weight for height Z score less than 3SD, which was lower than ours finding. As such it appears that distribution of SAM patients may vary from region to region and accordingly nutritional rehabilitation should be planned for better recovery.

Regarding co-morbidities, pneumonia (50.6%) and acute gastroenteritis (20.8%) were the most common conditions at presentation in our cases. Other studies 6, 11-13 reported acute gastroenteritis being the most common co-morbid condition followed by respiratory tract infections in their cohort of SAM.

Kumar et al. 11 reported other co-morbidities like tuberculosis, malaria, measles and HIV infection in their series. We did not find these conditions except tuberculosis in only 2.6% of patients. Instead, other diseases like bacterial meningitis, congenital heart diseases, febrile convulsions, kalaazar, and urinary tract infections were present but in small proportion of cases. This shows that variation in spectrum of diseases in SAM can be found. However, two common morbidities associate with SAM such as pneumonia and acute gastroenteritis should be looked on priority basis at hospitalization and managed appropriately. Sepsis is another severe condition, which has been found earlier 11, 14 were not present in any of our patients.

Increased serum uric, creatinine and electrolyte disturbances are indicative of acute kidney injury with multiple complications at hospitalization. The situation is further aggravated by anemia and hypobunemia, which can lead to, impaired immune status and thus increased chances of infections. Presence of leucocytosis and leucopenia further supports its presence in these children.

These children are often complicated with respiratory and gastrointestinal infections along with biochemical abnormalities at hospitalization requiring urgent attention and therapy. Treatment of conditions as per WHO guidelines have been advocated for rapid normalization of conditions. 15 A recent report from India on a larger cohort of children with SAM demonstrated that one can achieve higher cure rates in uncomplicated SAM even with community based management of these cases. 16 This is essential to break the malnutrition-disease vicious cycle phenomenon and improved survival.

Competing interest: None

Author’s contributions: AT and GSS - involved in study design, conduction, data analysis and drafting of manuscript and QPM- helped in data analysis and critical revision of manuscript.

References
Congenital Heart Defects (CHD) is a type of heart or intrathoracic great vessels that is actually or potentially of functional significance. Heart defects are the most common defect & the leading cause of birth defect related deaths. The incidence of CHD in premature infants is about 1% or more precisely, 8 to 12 of 1,000 live births. This does not include PDA (Patent Ductus Arteriosus) in premature infants which have potential to close spontaneously in few months of life. The relative frequency of different major forms of CHD also differs. CHD involves defect in septum within the heart, valves & great vessels in isolation or in combination which results in severe form of complex defect. Signs and symptoms depend on the specific types of the defects. About 2/3 of these defects are different manifestations of CHD in neonatal period, especially during the first week of life if no proper treatment is given.

Nobody is immune against CHD. The cause of CHD may be either genetic or environmental, but is usually a combination of both (Genetic Environmental Interaction), unknown in most of the cases (~90%). Known Environmental factors include certain infections during pregnancy (Rubella, Cytomegalovirus, Herpes Virus, Coxsackie Virus B in first trimester), use of certain medications or drugs (such as Amphetamines, Lithium, Thalidomide, Hydantoins, Progesterone, Estrogen), alcohol or tobacco, exposure to radiation, maternal illness (Diabetes mellitus, Hypertension, Phenylketonuria, Systemic Lupus Erythematosus), prepregnancy folate deficiency. Parents being closely related, poor nutritional status or obesity in mother, having parent and siblings with a CHD is also a risk factor. A number of genetic conditions associated with congenital heart defects include Down Syndrome, Turner Syndrome, Noonan Syndrome, Marfan Syndrome, Holt-Oram Syndrome, Hurler Syndrome, DiGeorge Syndrome. Also present with some association like VACTERL.

CHD are classified into 2 main groups. A cyanotic & Cyanotic heart defects depending on whether the child has potential to turn bluish colour at rest or during exertion. Acyanotic Heart defects include shunt lesions and obstructive lesions. Ventricular Septal Defect (VSD), Atrial Septal Defect (ASD), Patent Ductus Arteriosus (PDA), Atrio-Ventricular Septal Defect (AVSD), Aortopulmonary Window (AP Window) are shunt lesions and obstructive lesions are Pulmonary Stenosis, Aortic Stenosis, Coarctation of Aorta, Intermurpied Aortic Arch. VSD is the most common acyanotic congenital heart defect. Cyanotic heart defects are usually complex and includes Tetralogy of Fallot (TOF), Total Anomalous Pulmonary Venous Connection (TAPVC), Transposition of Great Arteries (TGA), Tricuspid Atresia, Pulmonary Atresia, Truncus Arteriosus. Other complex defects include Ebstein’s anomaly. Double Outlet right ventricle, Common Atrium, Univentricular heart with Hypoplastic right or left ventricle TOF is the most common cyanotic heart defect.

Signs and symptoms are related to type and severity of the heart defects, ranging from asymptomatic and possible for some CHD to go undetected throughout life to symptoms of breath, fast heart beat, growth failure, feeding difficulties with prolonged feeding time, excessive perspiration, irritability, exercise intolerance, persistent blueness of tongue, worsened by crying, recurrent respiratory tract infection, recurrent episodes of heart failure, squatting to relieve paroxysmal hyperpnea, fainting, presence of extra-cardiac congenital malformation needing early intervention.

Electrocardiography (ECG), Chest X-ray and Echocardiography (ECHO) is main investigations. ECHO is the most important imaging modality for the diagnosis. Sometimes other modalities like Cardiac Catheterization, CT Angiogram may be necessary for the further information in certain very complex cases. Foetal ECHO is used to diagnose heart defects prenatally.

As cause of the CHD is unclear in most of the cases, no much can be done for its prevention, and are partly preventable through Rubella vaccination; the adding of iodine to salt, adding of Folic Acid to certain food products, avoidance of alcohol, tobacco, radiation exposure, use of medications only on physician advice during pregnancy, treatment of malnutrition, prevent from being obesity of mother etc.

Sometimes isolated mild form of small defects improve without treatment, some needs only regular follow up. Most of the time CHD is serious and requires early catheter based intervention or surgery and/or medications. Some complex defects even need multiple surgeries with lifelong medications too.
Pulmonary Rehabilitation

Comprehensive pulmonary rehabilitation (PR) programs are well established as a means to enhance standard medical therapy, control and alleviate symptoms, optimize functional capacity, and reduce disability for patients with chronic lung diseases. The primary goal is to restore the patient to the highest possible level of independent function. This can be accomplished by helping patients to become (1) more knowledgeable about their disease, (2) more actively involved in their own healthcare, and (3) more independent in performing daily care activities.

The typical program includes multidisciplinary participation by physicians, nurses, respiratory and physical therapists, exercise specialists, psychologists, and other healthcare professionals with particular expertise. The program should be tailored to the needs of the individual patient. To be successful, it should address important emotional and psychosocial problems as well as help to optimize medical therapy to improve lung function.

Any patient with symptomatic chronic lung disease can be a candidate for PR. The greatest experience with PR has been in patients with chronic obstructive pulmonary disease (COPD); PR is also found to be a beneficial adjunct to surgical programs such as lung transplantation and lung volume reduction surgery. In these settings, PR not only helps to prepare patients for surgery and facilitate their recovery, but also aids in selection by assisting both patients and staff to better understand and weigh the risks and potential benefits.

Patients should be stabilized on standard medical therapy and evaluated carefully before entering a program so that appropriate and realistic goals can be set. Pulmonary function tests are used to characterize the lung disease and quantify its severity; however, patient selection should be based on symptoms and disability, not on arbitrary criteria based on lung function alone. Exercise testing helps to assess initial exercise tolerance, evaluate possible blood gas changes (e.g., exercise-induced hypoxemia), and plan a safe and appropriate training program.

The components of a comprehensive PR program include education, instruction in respiratory chest physiotherapy techniques, psychosocial support, and exercise training. Educating patients and significant others about lung disease and teaching them specific ways to deal with problems are essential. Educated patients are better able to cope with their disease, easier to deal with, and more likely to avoid unnecessary visits to physicians’ offices, emergency departments, and hospitals. Patients should be taught appropriate chest and respiratory therapy techniques. Proper coughing and postural drainage techniques are important for all patients, especially those with excess mucus production. Techniques of pursed-lip and diaphragmatic breathing and relaxation training helps to improve ventilatory efficiency and assist patients in gaining control over the frightening symptom of dyspnea. Patients with respiratory therapy equipment should be instructed in its proper use, care, and cleaning.

Patients with significant hypoxemia should be evaluated for optimal methods of continuous oxygen therapy and instructed in its proper use because oxygen therapy has been shown to improve survival and to reduce morbidity. Lightweight portable systems should be emphasized for ambulatory patients.

Patients with chronic lung disease have significant psychosocial problems as they struggle to cope with symptoms that are often poorly understood. They become depressed, frightened, anxious, and dependent on others to care for their needs. Progressive breathlessness leads to a vicious fear-dyspnea cycle in which increasing dyspnea produces more fear and anxiety that, in turn, leads to more dyspnea. In PR, these problems can be dealt effectively by enthusiastic and supportive staff, who can communicate with, understand, and motivate these patients. Family members and friends should be included in program activities. Support groups and group therapy sessions are also effective. Patients with severe psychiatric disorders may benefit from individual counseling and psychotherapy. Psychotropic drugs are generally reserved for these patients with severe levels of psychological dysfunction.

Exercise training provides both physiological and psychological benefits and is an ideal opportunity for patients to practice methods for controlling dyspnea. The exercise program should be safe and designed appropriately for each patient. Walking programs are particularly useful and have the added benefit of encouraging patients to expand their social horizons. Other types of exercise (e.g., cycling, swimming) are also effective. Because many patients with chronic lung disease have limited exercise tolerance, emphasis should be placed on increasing endurance, (the time of sustained activity). Exercise training of the upper extremities may be beneficial for the many pulmonary patients who report disabling dyspnea for daily care activities involving the arms (e.g., lifting, grooming) at work levels much lower than for the legs.

In recent years, increased attention has been drawn to peripheral muscle dysfunction in patients with chronic lung disease and the role of muscle fatigue as a limitation to exercise tolerance. This has stimulated new research initiatives in this area. Specific peripheral muscle strength and endurance training regimens have been developed and incorporated into PR programs. Although ventilatory muscles can be trained successfully, the role of this type of training in improving exercise performance has not been clearly established.

Exercise-induced hypoxemia occurs unpredictably in patients with COPD who may not be hypoxic at rest. Hypoxemia is not a contraindication to exercise training. Such patients can be given convenient, lightweight portable systems for ambulatory oxygen so that exercise can be performed safely.

As an effective & preventive healthcare intervention, PR has proved to be cost effective in decreasing both hospitalization days and the use of expensive medical resources. After rehabilitation, patients have an improved quality of life, reduced symptoms, increased exercise tolerance, more independence, increased ability to perform activities of daily living, and improvement in psychological function (with less anxiety and depression and increased feelings of hope, control, and self-esteem). Even after a short-term intervention, benefits typically last for at least 1 to 2 years.
Antibiotics have been used for the last 70 years in treating patients with different bacterial infections. Since 1940s, these drugs have reduced the illness & death of the patients from various infectious diseases. However, overuse and misuse of these drugs have contributed in increasing antibiotic resistance. Globally, antibiotic resistance is a growing public health concern. Not only treatment of the patient infected with an antibiotic resistant bacterium will be more difficult, but the resistant bacterium may spread to the other people as well. So a rational use of antibiotic is a prime focus in today’s period.

Cephalosporins are a group of broad spectrum, semi-synthetic beta-lactam antibiotics derived from the mould cephalosporium. The early cephalosporins differed mainly with respect to pharmacokinetic characteristics. Later generations are more resistant to β-lactam destruction and are often characterized by extended but variable spectra. They are effective in treating different bacterial infections.

TIME Pharmaceuticals, for the 1st time in Nepal introducing the 3rd generation cephalosporin molecule CEFDINIR.

Pharmacology

Pharmacodynamics

Cefdinir binds to one or more of the penicillin-binding proteins (PBPs) which inhibits the final transpeptidation step of peptidoglycan synthesis in bacterial cell wall, thus inhibiting biosynthesis and arresting cell wall assembly resulting in bacterial cell death.

Pharmacokinetics

In paediatric patients 6 months to 12 years of age who received a single 7 mg/kg oral dose of cefdinir as the suspension, peak plasma concentration was attained 2.2 hours after the dose and averaged 2.33 mcg/ml. Single 14 mg/kg oral doses in these patients resulted in peak plasma concentrations averaging 3.86 mcg/ml at 1.8 hours after the dose.

Distribution

The volume of distribution of cefdinir averages 0.67 L/kg in children 6 months to 12 years of age and 0.35 L/kg in adults. 60-70% bound to plasma proteins; binding is independent of drug concentrations.

Metabolism and Elimination

It is not appreciably metabolized. The drug is excreted principally via renal excretion. Renal dysfunction reduces the clearance of cefdinir and results in the need to reduce dosing frequency. Approximately 6% of a cefdinir dose is removed by hemodialysis. No dosage adjustment is needed in patients with hepatic impairment. The half-life of cefdinir is 2.2 ± 0.8 hours after a 7 mg/kg dose and 1.8 ± 0.4 hours after a 14 mg/kg dose.

Indication

Acute Otitis Media
Pharyngitis & Tonsillitis
Respiratory Tract Infections
Acute Exacerbation of Chronic Bronchitis (AECB)
Acute Sinusitis
Community Acquired Pneumonia
Skin & Skin Structure Infections

Dose

Children 13 years of age or older or those weighing 43 kg may receive the usual adult dosage of cefdinir.

The adult dose of cefdinir is 300 mg every 12 hours for 5-10 days or 600 mg once daily for 10 days. For paediatric patients beyond the neonatal period, the American Academy of Paediatrics (AAP) recommends a cefdinir dosage of 14 mg/kg daily given in 1 or 2 divided doses (maximum 600mg daily) for the treatment of mild to moderate infections.

Side effect

Diarhoea, rash, vomiting, oral thrush, abdominal pain, vaginitis or vaginal moniliasis

Contraindication

Hypersensitivity to cephapirin.

Special Precaution

Penicillin-sensitive patients, superinfection, seizure, pseudomembranous colitis, pregnancy, lactation, renal or hepatic insufficiency.

Drug interaction

Concomitant administration with antacids and iron reduce the rate and extent of absorption.

Probencid reduces renal elimination.

Figurine Category

Category B

Administration

May be taken with or without food. Avoid a high-fat meal.

Storage

Oral Store at 25°C.

Winner of MEDITIME 20 Issue:

Dr. Shankar Baral
MD Medicine
Gandaki Medical College, Pokhara

Dr. Bibhuti Upadhyay
MD
Kathmandu

Dr. Raj Kiran Pandit
MD Obst and Gyna
Janakpur

Dr. Ashutosh Pokharel
Dermatologist
Naryangadh
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STEM CELL THERAPY FROM MENSTRUAL BLOOD

Suviti Rasniygar Shag

Introduction:
Menstrual blood has always been an important and the most emerging part of research. Menstrual blood represents a novel source of stem cells and is recognized to have a remarkable capacity in the lining of the uterus for regeneration after each menstrual cycle. Extraction of this rich source of cells is efficient and noncontroversial. Stem Cells from Menstrual blood could potentially be incorporated into treatments for stroke, Alzheimer's disease and Lou Gehrig's disease, or amyotrophic lateral sclerosis, kind of puts a different spin on things.

Definition:
Before coming to menstrual blood stem cells, what are cells? Well, cells are the basic structural, functional, and biological unit of all known living organisms that has the capacity to replicate independently. While stem cells are a group of unspecialized cells that can be transformed into almost any type of cell given the correct genetic impulse and chemicals.

Advantages:
Over embryonic stem cells:
Since, not all donor is compatible to the patient there are high chances that patient might die while waiting for the required donor to appear also this might harm the foetus in the extraction procedure as reported.

Over adult stem cell:
• Less willing donors
• As everyone is attached to the contents in their bone marrow while none to their unpregnant uterus
• May lead to leukemia.

Associated Freuds:
• There are some institutes and websites making a earning out of this
• They claim to treat conditions without any basic theory
• Also, the cells that are delivered are not up to mark i.e. almost degenerated.

Difficulties:
• Difficult to culture
• Costly
• If not done properly can lead to more dangerous condition
• Risky
• Skilled manpower required.

Conclusion:
Now the question is that, would you be a recipient of stem cells from menstrual blood? Can it be the next big thing? If it would save your life, I bet you would. Menstruation can now be used as a boon with skilled manpower and also get less annoying. It can add another dimension for treating our body malfunction and disorder. As, it is advantageous over other stem cells, it is the sought-after stem cells, this should be made cost effective in order to reach the mass public. And also, its power is not limited to this and yet to be UNLEASHED.

References:
6. University of Stavanger.

In treatment of diabetes:
Three mice induced with Diabetes were injected with insulin producing stem cells that was modified using chemicals, this resulted in eradication of diabetes and they did not require any other insulin or drugs in a test performed up to six months. They were completely healthy during the entire period and no sign of hyperglycemia was seen.

In treatment of neurological disorder (Potential in dementia):
Treatment using stem cells in studies have confirmed that they can form completely new neurons and also those that are degenerating. Since, it has shown highest potential in the treatment of dementia. This can come up to be alternate therapy.

Low risk of turning to cancer cell:
As, embryonic stem cells have the capacity to divide forever, there is a high risk for them in turning into cancer cells. But, as the menstrual blood stem cells do not have that capacity they stop division after a certain period of time, so there is almost no risk of unwanted modification that would turn them into cancer producing cells.

In treatment of new era of medicine:
Well, studies have shown that these cells have the capacity to turn into almost any type of specified cells. Since, it can be transformed into the required type of cell it can be used up for the required diseased condition or in disorders to heal the body of it.

How is it collected cultured and stored:
The blood is collected during a woman’s menstrual period by using a medical grade silicone menstrual cup in place of a tampon or sanitary napkin, which is inserted by the physician. Depending on the patient’s menstrual flow, the menstrual cup should be in place 1-4 hours, but no longer than 4 hours. During this time, the patient should go about their normal routine and return to the physician’s office for removal. The collected menstrual fluid is placed into the menstrual collection container with media, tightly closed and secured, then gently inverted to mix the media solution with the menstrual fluid. These are cultured in temperature controlled rooms and given the required chemicals and genetic impulse can be specified in the type of cell as per the requirement i.e. cardiac, nerve, skin etc.

This procedure is time consuming and requires staff with a specific expertise.
BRAIN TEASER

1. I am a married woman. Rakesh's son is my daughter's father. What is my relation to Rakesh?

2. Mike is a butcher. He is 5'10" tall. What does he weigh?

3. What is full of holes but can still hold water?

4. Divide 30 by 1/2 and add 10. What is the answer?

5. What fruit has its outside on the inside?

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Diagnoses & Blog Table
Pollution responsible for quarter of deaths of young children

A polluted environment is a deadly one, particularly for young children. According to reports formulated by WHO, pollution is responsible for one in four deaths among all children under five; with toxic air, unsafe water and lack of sanitation being the leading cause. Each year 1.7 million under fives are dying due to polluted environment. As stated in report, their developing organs and immune systems, and smaller bodies and airways; make them especially vulnerable to dirty air and water. The harm from air pollution can begin in the womb and increase the risk of premature birth. After birth, air pollution raises the risk of pneumonia, a major cause of death for under fives, and of lifelong conditions such as asthma. It may also increase the risk of heart disease, stroke and cancer in later life. In May 2016, WHO announced that air pollution around the world is rising at an alarming rate, with virtually all cities in poorer nations blighted by unhealthy air. And we all know that Nepal continues to rank among the worst performers in protecting the human health and environment due to degrading air quality. So, it has been the serious issue now we have to pay attention to prevent next generation from getting diseases. Not only this, most Nepalese children are also suffering from malnutrition, the bitter truth we all know. If we do not pay good attention in time to minimize the polluted environment, such as quality of air, water and sanitation, it will be curse for the children to get birth as they have to suffer from different diseases by birth. So, as action speaks louder than noise, I request for the action from each to minimize the pollution; rather than pointing towards government only.

In this issue, we are supported with articles related to pediatrics, raising the issues related to malnutrition and congenital birth defects. Beside this, it also includes the articles related to prostate cancer, pulmonary rehabilitation and many more. We always feel honored to share the information from our valued doctors with our readers. I thankfully acknowledge all medical fraternities for your continuous support to our MEDITIME, and wish similar support with valuable feedback and suggestions for improvement in it.

Lastly, I wish you all a very Happy New Year 2074 and request you to make New Year resolution to contribute in making healthier environment.
Defeat the encountered infections, all the ways

Dinir
Cefdinir 125mg & 250mg DT

Analysis of Co-morbidities in Children with Severe Acute Malnutrition in Eastern Region of Nepal.

Congenital Heart Defects

CEFDINER

We prioritize the little one with quality healthcare.

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