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# Teens

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Child Development Centre "Reduction of Childhood Disability"

# Teens

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# Editorial

Folate insufficiency is considered as the most important nutritional risk factor for Neural Tube defects (NTDs) and supplementation with folic acid has been associated with a reduced risk of NTDs. The percentage of pregnant women with a serum folic acid level less than 3 ng/mL (which shows deficiency level) was highest among pregnant women in Sri Lanka (57%), followed by India (41.6%) as per WHO reports[1]. Poor serum folic acid levels are linked with negative health outcomes in pregnancy like abruptio placentae, pre-eclampsia, spontaneous abortion, congenital heart defects, stillbirth, preterm delivery, low birth weight, and birth defects of the brain and spine.

World Health Organization recommends that "all women, from the moment they begin trying to conceive until 12 weeks of gestation, should take a folic acid supplement (0.4 mg(400 µg) folic acid daily)[2]". Sincethe neural tube closes by day 28 of pregnancy, it is important that folic acid be consumed in sufficient amounts prior to pregnancy and in the early stages of pregnancy. Evidence from Systematic Reviews and Meta-Analysis suggest that Folic acid plays a vital role in preventing the occurrence and recurrence of NTDs[3]. There is suggestive evidence of protection from cardiovascular defects, Down syndrome, limb defects, cleft lip with or without cleft palate, urinary tract anomalies and congenital hydrocephalus.

Periconceptional intake of Folic Acid is proven to be a cost effective strategy in reducing NTDs. The potential barrier is that, the prevalence of planned birth in India is only 52 percent[4] and it may be the reason for some lack of advocacy for propagating need for folic acid consumption before pregnancy in India. Many countries around the world have adopted different strategies such as health education campaigns, communication through grass root level health workers and food fortification for improving the periconceptional intake of folic acid. There is no existent highly recommended guidelines recommending the periconceptional intake of folic acid in India. Rising need prevails to translate these recommendations into action on an enormous level. Robust policy level initiatives and actions in a mission mode is required for itsimplementation which will have long term effects in preventing or reducing disabilities in the state.

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**Dr. Babu George**

# Periconceptional daily folic acid supplementation for prevention of neural tube defects

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**Abstract**

Poor serum folic acid levels are linked with negative health outcomes in pregnancy like abruptio placentae, preeclampsia, spontaneous abortion, congenital heart defects, stillbirth, preterm delivery, low birth weight, and serious birth defects of the brain and spine. Folate insufficiency is considered the most important nutritional risk factor for Neural Tube Defects and supplementation with folic acid has been associated with a reduced risk of the same. Because the neural tube closes by day 28 of pregnancy, a period when pregnancy may not have been detected, it is important that folic acid be consumed in sufficient amounts prior to pregnancy and in the early stages of pregnancy. Folic acid supplementation after the first month of pregnancy will not only prevent neural tube defects, but also will contribute to other aspects of maternal and fetal health. WHO recommends that "all women, from the moment they begin trying to conceive until 12 weeks of gestation, should take a folic acid supplement (400 µg folic acid daily). Campaigns stressing the importance of periconceptional folic acid intake shall be begun and strong policy level inclusions shall be made.

*Key words: Folic acid, Neural Tube Defects, Folate insufficiency, Periconceptional*

**Epidemiology of Neural Tube Defects (NTDs)**

Folate is a water-soluble B vitamin present in legumes, leafy green vegetables (such as spinach and turnip greens) and some fruits (such as citrus fruits and juices). Folic acid is the synthetic and most stable form of folate and the form often used in supplements and in fortified foods.

Congenital anomalies, also known as birth defects, can be defined as structural or functional abnormalities, including metabolic disorders, which are present from birth and can be caused by single gene defects, chromosomal disorders, multifactorial inheritance, environmental teratogens or micronutrient deficiencies (1). NTDs originate from a failure in the development of the embryonic nervous system at very early stages of gestation. Moreover, NTDs affect the brain and spinal cord and anencephaly, spina bifida and encephalocele are the most frequent phenotypes of NTDs (2). Approximately half of all congenital anomalies cannot be linked to a specific cause. However, there are some known causes or risk factors for congenital anomalies, including socioeconomic factors, genetic factors, infections, maternal nutritional status and environmental factors (3).

**Burden of NTDs**

Congenital anomalies (also referred as birth defects) affect an estimated 1 in 33 infants and result in approximately 3.2 million birth defect-related disabilities every year. The NTD burden was recently assessed in 18 countries in 6 WHO regions. The overall burden calculated using the median was 1.67/1000 live births for total NTD burden, 1.13/1000 for spina bifida, 0.25/1000 for anencephaly and 0.15/1000 for encephalocele. It further estimated that about 190 000 neonates were born each year with a NTD in low- and middle-income countries. In 2010, an estimated 270 000 deaths globally were attributable to congenital anomalies during the first 28 days of life, with NTDs being one of the most serious and most common

of these anomalies (4). In 2005, the rates of spina bifida and anencephaly in the United States were 17.96 per 100 000 live births and 11.11 per 100 000 live births, respectively. The prevalence of NTD from different parts of India has been reported to vary from 0.5 to 11 per 1000 births (5-8).

Suspicion of a NTD may be raised by a maternal serum screening test during the second trimester of pregnancy which detects an elevated concentration of alpha-feto-protein. The diagnosis is confirmed by ultrasound examination during the second trimester of pregnancy.

Cleft lip and palate can be identified on detailed ultrasound examination, but if there is only involvement of the palate, diagnosis by ultrasound can be difficult, and often not established until after birth. Unfortunately, these tests are not yet routinely done in most developing countries. Today, as infant mortality rates fall, birth defects are responsible for an increasing proportion of infant mortality and morbidity (9).

Affected infants have difficulty with feeding and later with speech development, hearing and tooth formation. Stigmatisation and discrimination may pose lifelong problems. Malnutrition and infection resulting from cleft lip or cleft palate, or both, can lead to severe illness and, in some cases, death.

**Folic acid deficiency and Neural Tube Defects**

A report from the World Health Organization indicated that the percentage of pregnant women with a serum folic acid level less than 3 ng/mL was highest among pregnant women in Sri Lanka (57%), followed by India (41.6%). Poor serum folic acid levels are linked with negative health outcomes in pregnancy like abruptio placentae, preeclampsia, spontaneous abortion, congenital heart defects, stillbirth, preterm delivery, low birth weight, and serious birth defects of the brain and spine (10).

For NTDs, folate insufficiency is considered the most important nutritional risk factor for NTDs and supplementation with folic acid has been associated with a reduced risk of NTDs.

In 1991, one randomised controlled trial (RCT) demonstrated that periconceptional folic acid supplementation prevented the recurrence of NTDs (11) and in 1992 another RCT showed that a multiple micronutrient supplement containing folic acid prevented the occurrence of NTDs (12). The latter results were confirmed in a public health campaign among women preparing for marriage conducted between 1993 and 1995 in China after which the risk of neural tube defects among the fetuses or infants of the women who took a folic acid supplement more than 80% of the time decreased by between 40% and 85% (13).

One of the most remarkable developments in the field of teratogenesis during last two decades has been the demonstration of efficacy of periconceptional folic acid supplementation in prevention of NTD (14,15). The double blind randomized trial of Medical Research Council, Great Britain has shown that supplementation of 4 mg folic acid per day for at least one month prior to conception to 3 months' post conception reduces the risk of recurrence of NTD by 70%(16). The timing of folic acid supplementation for prevention of NTD is very critical since neural tube in humans closes between days 17-30 post-ovulation, which corresponds to day 2 to 1 5 post-Last Menstrual Periods. ***Because the neural tube closes by day 28 of pregnancy, a period when pregnancy may not have been detected, it is important that folic acid be consumed in sufficient amounts prior to pregnancy and in the early stages of pregnancy. Folic acid supplementation after the first month of pregnancy will not only prevent neural tube defects, but also will contribute to other aspects of maternal and fetal health.***

While maternal intake of folate and folic acid is specifically associated with a decreased risk for NTDs they may also provide protection for other selected birth defects. There is suggestive evidence of protection from cardiovascular defects, Down

syndrome, limb defects, cleft lip with or without cleft palate, urinary tract anomalies and congenital hydrocephalus (17-18). In the case of orofacial clefts, there are several similarities with NTDs: their occurrence at a similar time during embryogenesis, their involvement with the midline of the embryo, their near identical population characteristics and similar gene contributions. There is also some evidence of a suggested protective effect of folic acid use, especially for cleft lip with or without cleft palate (19), although this remains controversial, possibly because of the differences in dosage and type of supplementation (e.g. folic acid alone or with other micronutrients) used among studies. Approximately half of birth defects are limited to a single organ and the other half frequently present additional birth defects, such as heart malformations.

Several gene polymorphisms affect folate metabolism and are associated with reduced folate absorption and therefore increased folate needs. Some of the most studied mutations are the methylene-tetrahydrofolatereductase (MTHFR) gene and the reduced folate carrier (RFC1) gene. The former affects 8% to 35% of the population, depending on ethnicity. In the absence of a folate-sufficient diet, these mutations are associated with increased risk of NTDs and conotruncal defects in the offspring (24).

Folic acid intake may also affect fetal and child growth. Observational and controlled trials have showed a positive effect of periconceptional folic acid supplementation on fetal growth.

Economic evaluations suggest that periconceptional supplementation of folic acid is a good use of healthcare resources and justifies further promotion of the use of folic acid supplementation prior to pregnancy (25). The cost per life year gained from periconceptional supplementation of folic acid was estimated to be €2,108 (1, 64,538.35 Indian Rupees) in the Netherlands (26)

**Strategies for prevention of NTDs**

The impact of folate insufficiency on birth defects in different populations varies with each healthcare system. It partly relates to the use and coverage of preventive strategies including education and awareness of the importance of folic acid intake among women of reproductive age, access to and/or distribution of prepregnancy folic acid supplements, and/or fortification of staple foods with folic acid, in some cases with mandatory regulations for fortification of foods such as wheat and maize flour (20). Recent evidence demonstrates that public health policies which include folic acid fortification of staple foods are likely to result in a large-scale prevention of NTDs (21-23). It would seem reasonable to implement both interventions fully, especially in countries with a high prevalence of birth defects.

**Recommendations on periconceptional folic acid supplementation**

**1. WHO recommendation**

WHO recommends that "all women, from the moment they begin trying to conceive until 12 weeks of gestation, should take a folic acid supplement (400 µg folic acid daily)" (27).

**2. NICE recommendation**

National Institute for health and Care Excellence recommends that,

"A health professional should: use any appropriate opportunity to advise women who may become pregnant that they can most easily reduce the risk of having a baby with a neural tube defect (for example, anencephaly and spina bifida) by taking folic acid supplements. Advise them to take 400 micrograms (µg) daily before pregnancy and throughout the first 12 weeks, even if they are already eating foods fortified with folic acid or rich in folate" (28).

**3. AAP recommendation**

"The American Academy of Pediatrics (AAP)

endorses the USPHS (US Public Health Services) recommendation that all women of childbearing age who are capable of becoming pregnant should consume 400 (0.4 mg) µg of folic acid daily" (29).

Indian scenario of periconceptional folic acid consumption

The prevalence of NTD from different parts of India has been reported to vary from 0.5 to 11 per 1000 births. Oro-facial clefts, particularly cleft lip with (CLP) or without (CL) cleft palate and cleft palate alone (CP) are a major public health problem affecting 1 in every 500 to 1000 births worldwide (30, 31). A child is born with a cleft somewhere in the world every 2 minutes according to a WHO study published in 2001(32). In India alone the number of infants born every year with CLP is 28,600, which means 78 affected infants are born every day, or 3 infants with clefts born every hour (33). In a study assessing the incidence of Cleft Lip and Cleft Palate in South India, the results showed that the birth rate of clefts was found to be 1.09 for every 1000 live birth (34).

In a developing country like India where catastrophic health expenditure is high, it is important to reduce the burden of NTDs. Periconceptional consumption of Folic Acid is proven to be a cost effective strategy in reducing NTDs. The potential barrier is that the prevalence of planned birth in India is only 52 percent (35). So the approaches should be such that it will reach out to the population

**Conclusion**

Although consumption of folic acid is recommended from first month of pregnancy, there is a lack of advocacy for propagating need for folic acid consumption before pregnancy in India. Many countries around the world have adopted different strategies such as health education campaigns, communication through grassroot level health workers and food fortification for improving the periconceptional intake of folic acid. There is no existent guideline recommending the periconceptional intake of folic acid available in India. Campaigns stressing the importance of periconceptional folic acid intake shall be begun and strong policy level inclusions shall be made for the same.

**Key Messages**

- Each year 1.67/1000 live births are with neural tube defects (NTD). Low folate status in the mother is associated with increased incidence of NTD in her fetus.
- Periconceptional intake of 400 µg of folic acid per day by the pregnant women (starting from 1 month prior to 3 months after conception) can prevent 75% of all neural tube defects.
- Suggested strategies to prevent folic acid associated NTD include food fortification, vitamin supplementation and dietary modifications.

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# Developmental Outcome of Very Low Birth Weight Babies at 4 months and 8 months of corrected age.

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**Abstract**

Background and objectives: Very Low Birth Weight Babies have risk for neurodevelopmental delay. Our study aimed to determine developmental outcome of Very Low Birth Weight babies receiving early stimulation at 4 and 8 months corrected age, using CDC grading, Denver Developmental Screening Test (DDST II) and Developmental Assessment Scale for Indian Infants (DASII).

Methodology: A descriptive study was conducted at CDC among 84 VLBW babies who were discharged from NICU of SAT hospital during the study period September 2014 – October 2015. Data analysis was done using SPSS for windows version 21.

Results: About 3.6% babies were suspected to have developmental delay in fine motor area and 14.3 % had delay in gross motor area in DDST II at 8 months corrected age. CDC grading found that 36.9 % had abnormal head control and 8.3% babies had abnormal sitting at 4 months and 8 months respectively. About 67.9 % of babies had normal motor DQ and 97.6% had normal mental DQ in DASII at 8 months.

**Conclusion:** CDC model of early stimulation could help in early detection and intervention of developmental delay among VLBW babies.

Keywords: “VLBW”, “DDST”, “Developmental Outcome”

**Introduction**

A baby’s weight at birth indicates the maternal and newborn nutrition and health. According to World Health Organization (WHO), Low Birth Weight (LBW) infants are born with birth weight of less than 2.5 Kg and Very Low Birth Weight (VLBW) infants are born with a birth weight of less than 1.5 kg.6 According to UNICEF, in 2013, 16% of babies bornduring that year had LBW. [3] According to Indian Statistical Institute, 20 % of Indian new borns had LBW in 2011.[2] There are evidences suggesting that developmental delays are common among Very low Birth Weight infants.[1] Early detection and early intervention are essential because it will enhance the motor development, cognitive, social and emotional development of these babies. Child Development Centre is routinely screening and following up the Low birth Weight children born in Sree Avittom Tirunal (SAT) hospital, Government Medical College, Thiruvananthapuram to identify any developmental delay and early interventions or stimulation programmes are being given to them. This CDC model early stimulation programme has been proved as a replicable model which can be implemented in developing countries like India. This model focuses mainly on strengthening the emotional bond, massage and sensory stimuli, respecting the natural development of baby and the natural instincts of their parents. CDC

screens the babies using CDC grading tool, Denver Developmental Screening Test (DDST) and Amiel-Tison Angles. The developmental outcome of these babies will be evaluated finally using the diagnostic test: viz. Developmental Assessment Scale for Indian Infants (DASII). So the aim of our study is to determine developmental outcome of Very Low Birth Weight babies receiving early stimulation at 4 and 8 months corrected age, using Developmental Assessment Scale for Indian Infants (DASII).

## Objectives

### Primary objective

To assess the developmental outcome of Very Low Birth Weight babies using screening tools DDST-II at 2, 4 and 8 months, CDC grading at 4 and 8 months and DASII at 8 months

### Secondary objective

To compare CDC grading for head holding at 4 months, sitting at 8 months among Very Low Birth Weight babies against DDST-II

### Materials and methods

A descriptive study was conducted at CDC from September 2014 to October 2015 among all Very Low Birth Weight babies discharged from Neonatal Intensive Care Unit (NICU) of SAT hospital during this period. About 84 VLBW babies constituted the sample size. All the VLBW babies born below 37 weeks were included for the study. The babies whose parents did not provide informed consent and those babies with severe neurological abnormalities and birth defects were excluded from the study. Ethics clearance was obtained from Institutional Ethics Committee of CDC. Study tools used were CDC grading for 3 milestones (head control, sitting, and standing) and Denver Developmental Screening Test II (DDST) for assessing developmental progress among children aged 0 to 6 years. It includes 4 areas: personal social, fine motor-adaptive, language and gross motor, Developmental Assessment Scale for Indian infants (DASII), which evaluates the development for newborn infants up to 2.5 years of age. The first visit of babies to CDC was at their time of discharge from NICU. The mothers were trained on the Very Low Birth Weight stimulation. Each baby was given 30-40 minutes developmental stimulation during monthly visit at 1,2,3,4,5,6 and 8 months of corrected age. The mothers were advised to continue this stimulation at their homes. During their monthly visit, developmental screening using CDC grading and DDST was done apart from growth monitoring and reinforcement of stimulation technique. Additional developmental stimulation techniques were provided if any developmental delay was found in any of these tests. DASII test was administered at the end of 8 months in addition to the above mentioned developmental tests. Data analysis was done using SPSS for windows version 21.

### Results

The developmental outcome of 84 VLBW babies was assessed during 4 months and 8 months corrected age. About 53.57% of babies were males and rest were females. Nearly half of them (41.7%) were upper middle class according to Kuppuswamy scale. Only 14.3 % babies were from joint family and the rest were either from nuclear or extended family. Majority of them came from rural areas (78.6%).

Figure 1 shows that only 6 % of the babies were born Extreme Low birth Weight (< 1 Kg). The rest majority were born between 1 Kg and 1.5 Kg.

**Figure1: Birth Weight Status of babies**

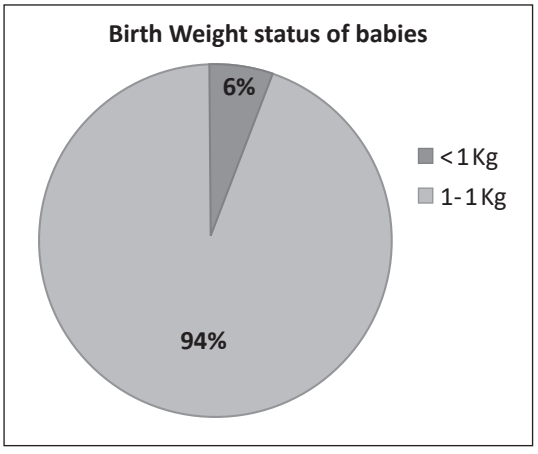

Table 1 describes the developmental status of babies using DDST II at 4 months and 8 months corrected age. At 2 months, about 31% of the babies were suspected to have delay in personal social area, 4.8% had delay in fine motor component, 1.2 % had delay in language and about 21.5% had delay in gross motor area. The percentage of babies with delay has declined subsequently at 4 months and 8 months follow up.

**Table 1: Weight Status of babies**

| DDST II | 2 Months N (%) | 4 Months N (%) | 8 Months N (%) |
|---|---|---|---|
| **Personal Social** | | | |
| Normal | 58 (69) | 77 (91.7) | 84 (100) |
| Suspect | 26 (31) | 7 (8.3) | 0(0) |
| **Fine motor** | | | |
| Normal | 80 (95.2%) | 80 (95.2) | 81 (96.4) |
| Suspect | 4 (4.8) | 4 (4.8) | 3 (3.6) |
| **Language** | | | |
| Normal | 83 (98.8) | 84 (100) | 84 (100) |
| Suspect | 1 (1.2) | 0 (0) | 0 (0) |
| **Gross motor** | | | |
| Normal | 66 (78.5) | 42 (50) | 72 (85.7) |
| Suspect | 18 (21.5) | 42 (50) | 12 (14.3) |

Table 2 describes gross motor assessment using CDC grading tool at 4 months and 8 months. It shows the developmental progression of VLBW babies using CDC grading for head control and sitting. About 36.9% had abnormal head control at 4 months and 8.3% had abnormality in sitting.

**Table 2: Gross motor assessment results using CDC grading tool**

| CDC grading tool | 4 Months N (%) | 8 Months N (%) |
|---|---|---|
| | Head Control | Sitting |
| Normal | 53 (63.1) | 77 (91.7) |
| Abnormal | 31 (36.9) | 7 (8.3) |

Table 3 describes motor DQ and mental DQ assessment at 8 months using DASII. About 32.1% of babies had abnormal motor DQ (less than 70) and 2.4% of babies had abnormal mental DQ at 8 months after receiving developmental stimulation at each month.

**Table 3: Assessment of Motor DQ and mental DQ using DASII at 8 months**

| **DASII Result** | **N (%)** |
|---|---|
| **Motor DQ** | |
| Normal (> 70) | 57 (67.9) |
| Abnormal (< 70) | 27 (32.1) |
| **Mental DQ** | |
| Normal (> 70) | 82 (97.6) |
| Abnormal (< 70) | 2 (2.4) |

Table 4 compares CDC grading of head control with DDST II at 4 months. CDC grading delay is considered as positive and the suspect in DDST II is considered positive. It shows that there are 30 true positives and 40 true negatives giving a sensitivity of 71.43% and specificity of 95.24%. It had positive predictive value of 93.75% and negative predictive value of 76.92% and diagnostic accuracy of 83.33%

**Table 4: Comparison of CDC grading (head control) with DDST II at 4 months**

| Head control | DDST II | | Total |
|---|---|---|---|
| | Normal N (%) | Suspect N (%) | |
| Normal | 40 (47.6) | 12 (14.2) | 52 (61.9) |
| Delay | 2 (2.3) | 30 (35.7) | 32 (38.1) |
| Total | 42 (50) | 42 (50) | 84 (100) |

Table 5 compares CDC grading of sitting with DDSTII at 8 months. CDC grading delay is considered as positive and the suspect in DDSTII is considered positive. It shows that there are 4 true positives and 69 true negatives giving a sensitivity of 33.33% and specificity of 95.83%. It had positive predictive value of 57.14 % and negative predictive value of 89.61 % and diagnostic accuracy of 86.9%.

**Table 5: Comparison of CDC grading (sitting) with DDST II at 8 months**

| Head control | DDST II | | Total |
|---|---|---|---|
| | Normal N (%) | Suspect N (%) | |
| Normal | 69 (82.1) | 8 (9.5) | 77 (91.6) |
| Delay | 3 (3.7) | 4 (4.76) | 7 (8.4) |
| Total | 72 (85.8) | 12 (14.2) | 84 (100) |

**Discussion**

The study was conducted among 84 VLBW babies discharged from NICU of SAT hospital. Our primary objective was to assess development of these babies using DDST II at 2, 4 and 8 months corrected age, using CDC grading tool at 4 and 8 months and using DASII at 8 months. The study found that about 100 % had normal personal social development and language development, 96.4% had normal fine motor development in DDST-II at 8 months which is much higher as compared to study conducted in Kolkata among VLBW babies at 12 months. According to that study, 88.9% had normal personal social development, 91.1 % had normal fine motor development and 91.9% had normal language development.[4] The percentage of babies with normal gross motor development was nearly same in both studies. The increase in the percentage of babies with normal development at 8 months may be due to early stimulation given to these babies at each follow up visit in CDC.

Our study found that only 2.4 % had abnormal Mental DQ and 32.1 % had abnormal Motor DQ at 8 months corrected age. The percentage of babies with abnormal mental DQ was lower compared to Motor DQ. On contrary, another Indian study reported that about 17% had abnormal Mental Developmental Quotient and 25.7 % had abnormal Motor Mental Quotient at one year corrected age.[5]

Our secondary objective was to compare the CDC grading with DDST II. Here DDST II was considered as the reference standard test. The comparison

of CDC grading for head control with DDST-II at 4 months found a sensitivity of 71.43% but on comparing CDC grading for sitting with DDST II at 8 months, it has only 33.33% sensitivity. It may be due to lack of sufficient sample size. The study can be conducted on a larger sample size to assess the diagnostic accuracy of the CDC grading test.

**Conclusion**

Very Low Birth Weight can affect the neuro development of babies. Early detection and early intervention or early stimulation could aid in proper development. Early developmental stimulation for these babies should be initiated as early as possible in the NICU by incorporating parents and medical personnel. CDC model early stimulation program could reduce the adverse consequences which can occur due to Very Low Birth Weight.

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# A Functional Assessment of Casualty Services in Government Medical College, Thiruvananthapuram

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**Abstract**

Emergency care for the patient is vital and thus the current situation of existing emergency services including human resources, infrastructure and other resources need to be studied. This study aims to look into the functioning of the casualty department in the Medical College, Thiruvananthapuram. The study sample constituted of Beneficiaries - Patients, By-standers or Visitors who visited or availed the casualty services. This study was conducted using a structured questionnaire. A total of 25 beneficiaries participated in the study. The beneficiaries were most dissatisfied with the observatory facilities at the casualty and the toilet facilities. The problems with infrastructure as well as inadequacy of the staff, medicine, equipment and deficiency of other resources were highlighted in the study. The services at the casualty need to be well planned to accommodate the needs of the beneficiaries. Policy changes and optimal health spending for the same are recommended.

Key Words: Patient satisfaction, emergency service, hospital, health care quality, casualty services

**Introduction**

An Emergency Medical Service (EMS) can be defined as "A comprehensive system which provides the arrangements of personnel, facilities and equipment for the effective, coordinated and timely delivery of health and safety services to victims of sudden illness or injury."(1)

Transportation systems account for major incidents and also industry buildings collapse or burns. Poisonings may either be due to food, water or alcohol consumption. Outbreaks of diseases can quickly outstrip the ability of local health care facilities to contain and treat them. Most vibrant among the public view are the natural disasters that endanger both the populations and environments such as floods, windstorms, and earthquakes. All governments bear the responsibility of protecting public by providing safety measures and emergency relief in crisis situations.

A trauma system is a set of arrangements and attentiveness to provide quality response to injured from the site of injury to the appropriate hospital for the full range of care. The primary objective of a trauma system is to diminish or eliminate the risk of death or permanent disability following traumatic events(2). Industrialization and increase in vehicles have given rise to more trauma. Poly trauma patients require not only urgent treatment, but also different types of attitude, approach, dedication, planning, preparedness and the well-coordinated as well as timely team work to have an effective outcome of a "Golden hour"(3).

The concept and practice of forming dedicated trauma response teams is yet to percolate beyond tertiary care hospitals(4). Enforcing professional management and effective governance is then absolutely essential since the implication of bad practices in the health sector hurts persons who are poor and suffer the double tragedy of being sick. Planning, infrastructure development,

information sharing system for coordination, human resource development and advocacy are the major groundwork required to formulate a local trauma system for capacity building. Research shall be conducted to determine the effectiveness of the current practices, guidelines, resource allocations and system capabilities (2).

**Objectives**

1. To evaluate the functioning of casualty Department in the Medical College Hospital, Thiruvananthapuram.
2. To assess the insufficiencies if any, with regard to the functioning of the casualty Department in the Medical College Hospital, Thiruvananthapuram.

**Materials and methods**

This study was a descriptive study conducted at Casualty Department of Government Medical College, Thiruvananthapuram. The study sample constituted Beneficiaries - Patients, By-standers or Visitors who visited or availed the casualty services of the Medical College, Thiruvananthapuram, at least twice or more, in a year. This study was conducted using a structured questionnaire in which questions about the services and short comings were asked. Consecutive patients, by-standers or visitors were selected until a number of 25 beneficiaries were obtained. The data was collected using two separate structured questionnaires for professionals and beneficiaries,

**Results**

In the beneficiary group, 25 participants actively participated in the survey. Majority of them were males (60%) and the rest 40% were females. The majority of the participants were in the age group of 40-50 years (58%) and 40% in the age group of 30-40 years. The majority of the public participants qualified up to graduate level (56%). All the participants included under the public were government servants. Majority of the participants (80%) had a monthly salary of 20,000 to 50,000.

All the participants had visited the casualty services several times during a year. The data shows that participants have visited the casualty at MCH mainly as by-standers, i.e., 68% of the respondents were by-standers, patients covers 20% of the sample and 12% were both patients as well as by-standers.

**Consultation time**

Regarding of consultation time at the casualty visits were much more frequent during the 8am-2pm by 52% and during 2pm-8pm by 24%. The public respondents who visited the facility during the overnight period (12 hour) or 24 hour period was 8% each respectively.

**Receiving Patients**

**Table 1: Staff who received the patient in the casualty**

| Staff who received the patient | N (%) |
|---|---|
| Security Staff | 3 (12) |
| Nurses | 3 (12) |
| Doctors | 1 (4) |
| None / Others | 18 (72) |
| Total | 25 (100) |

With respect to receiving patients, 72% of the participants did not get any concerned personnel to receive them, 12% each were received by the security staffs and Nurses and nearly 4% by Doctors.

**Table 2: Views of beneficiaries regarding various services**

| | Services/Facilities in the Casualty | Satisfied | Dissatisfied |
|---|---|---|---|
| a | Enquiry Services at the Registration Counter | 72% | 28% |
| b | Services of Casualty attenders | 40% | 60% |
| c | Services provided by the Doctors | 72% | 28% |
| d | Lab/x-ray/scanning services inside the casualty | 40% | 60% |
| e | Casualty Pharmacy Services | 52% | 48% |
| f | Nursing Services | 48% | 52% |
| g | Observatory Services in the Casualty | 23% | 77% |
| h | Toilet/Bathroom Facilities | 28% | 72% |
| i | Security services inside casualty | 48% | 52% |

**a. Enquiry Services at the Registration Counter**

With respect to the services received by the beneficiaries at the registration counter, 72% seems to be satisfied and only 28% were found to be unhappy. The reasons for dissatisfaction were due to lack of adequate information by 42.9%, the behaviours of staff at the counter by 28.6% and due to delayed responses encountered with density and crowding of patients (14.3% each)

**b. Services of Casualty Attenders**

About 40% of the participants who took part in the study were satisfied and remaining 60% were dissatisfied with the services being provided. The participants were dissatisfied due to lack of adequate service in time by 80% and 20% because of bad behaviour of staff.

**c. Services provided by the Doctors**

With respect to the services provided by the Doctors from the concerned departments, 72% of the beneficiaries were satisfied, however 28% were not satisfied. About 57.1% of the participants were unhappy with the services since the doctor did not provide adequate information about the disease and lack of adequate consultation was reported by 42.9%.

**d. Lab/x-ray/scanning services inside the casualty**

About 40% participants seemed to be satisfied with the casualty lab/x-ray/scanning services. The underperformance in casualty lab services were due to delay in getting results (46.7%), insufficient equipment (26.7%) and behavior of staffs.

**e. Casualty Pharmacy Services**

With regard to the pharmacy services availed in the casualty, 48% were dissatisfied.Lack of adequate medicines was reported by 66.7%, lack of medicine and staff reported by 16.7% and lack of staff and patient density raised by 8.3% each.

**f. Nursing Services**

Among the participants studied, 48% were satisfied with the nursing services. The beneficiaries were dissatisfied with the nursing services due to bad behavior of staff by 61%, shortage of medicines by 23.1% and high density of patients by 15.4%.

**g. Observatory Services in the Casualty**

With regard to the observatory services provided in the casualty, 52% of the beneficiaries seem to have utilized the facility. While asking about the services provided in the observation of the casualty, it was found that only 23% of the participants were happy with the adequate observatory services and 76.9% were dissatisfied. The main reasons for underperformance as reported by the participants were lack of facility and patient density (40% each) and lack of attention from Doctors and Nurses (20%).

**h. Availability of Toilet/Bathroom Facilities**

Only 28% of the respondents were satisfied with the toilet facilities and 72% were unhappy with the current situation, which shows that majority of the users are dissatisfied with facilities available. In the case of beneficiaries, dissatisfaction was due to lack of hygiene by 52.9%, lack of facility by17.6% and density of patients by 5.9%.

**i. Performance of Security services inside casualty**

The security services inside the casualty were found dissatisfactory by 48% of the beneficiaries and only 52% were satisfied. The reasons for underperformance in security services inside casualty were high density of patients (46.2%), and lack of adequate staff and facility (23.1%)

**Discussion**

This study shows that the maximum dissatisfaction was with the observatory services and toilet facilities in the casualty as reported by the patients. Similar findings were reported by professionals. Lab/x-ray/scanning services inside the casualty and Casualty Pharmacy Services were also reported to be inadequate by the professionals. The lack of building infrastructure, inadequacy of staff, medicine and equipment were highlighted in the study. It also showed that the available resources are not enough to cater to the needs of increased number of patients. There are studies reporting inadequate staff, equipment and infrastructure in the casualty of government as well as private hospitals in India(5). A study assessing patient satisfaction in emergency department of District Head Quarters Hospital, Rawalpindi found that majority were dissatisfied with basic requirements in emergency department of the hospital like availability of telephone, provision of safe drinking water and general sanitary conditions(6). In another study conducted in Iran it was found that 70% of the participants were dissatisfied with the emergency department(7). A study on factors affecting patient satisfaction with emergency department care done in Italy highlighted important areas of nursing care on which to initiate improvements such as explaining patients the colour waiting list, and communication towards patients(8).

Studies point out that inadequate budgeting in the emergency care at the hospital is one of the probable reasons for the underperformance of the casualty services(9). The public health system of India has only recently introduced emergency department as a specialty service(10). There is lack of emergency medicine (EM) specialists in India and also the post-graduate courses in EM has not gained foot in our medical education system so that the emergency services inside the hospital could be well coordinated(11).

**Conclusion**

This study shows the insufficiency of human resources and infrastructure in the casualty. To further look into this, studies such as time motion studies can be conducted. The services need to be well planned so as to accommodate the needs of the beneficiaries as well as the professionals. The fact that the number of patients availing the casualty services will increaseevery year is a matter to be considered seriously. Optimizing the health spending to improve the facilities of the emergency department needs timely consideration.

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# Diet: An inevitable element in Non-Communicable Diseases

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**Abstract**

The urbanization and globalization has bought about several changes in dietary and lifestyle changes in the modern world. The trajectory has now shifted from poverty to nutritional insufficiency. Most of the people are depending on food commodities which are prepared in factory other than food cooked at home due to their busy schedule or due to the increased taste of these market foods. Diet is a key modifiable risk factor of various non-communicable diseases such as cardiovascular diseases, diabetes mellitus, and cancer. The practice of over dependence on processed, high calorie and high fat content rich foods and the under dependence on whole grains, fruits, vegetables and other fibre containing foods are the leading causes of Non Communicable Diseases. The practice of proper dietary habits are essential to protect from various non-communicable diseases.

**Introduction**

Diet is food or drink eaten or drunk by a person or group. Due to urbanization and globalization, our lifestyle and dietary practices have changed to a great extent. Previously more people were in poverty. In current modernized world, the standard of living of people has improved and many people have come out of poverty compared to the past. The deaths due to over nutrition or inappropriate dietary patterns are much more than the mortality due to hunger. Most of the people are depending on food commodities which are prepared in factory other than food cooked at home due to their busy schedule or due to the increased taste of these market foods. These market foods will be rich in various ingredients which will predispose us to various chronic diseases eventually. Balanced diet is essential for us to lead a healthy life. It provides essential nutrients to the body which is needed to function properly. Poor eating habits, inadequate intake and high intake both can adversely affect the health of an individual.

Source: Health.am

**Impact of improper diet on the occurrence of Non communicable diseases**

Diet is a key modifiable risk factor of various non-communicable diseases such as cardiovascular diseases, diabetes mellitus, and cancer. Currently, many people are less dependent on plant based diet and they are moving towards high fat animal based diet. The over dependence on processed, high calorie and high fat content rich foods and the under dependence on whole grains, fruits, vegetables and other fibre containing foods are the leading causes of Non Communicable Diseases.

**Fat intake**

Abnormal blood lipid levels is a strong risk factor for development of cardiovascular diseases.Saturated and Trans fats could lead to atherosclerosis. High fat intake also leads to obesity, which is an important risk factor for the development of Non Communicable Diseases including diabetes, cancer and cardiovascular diseases.

**High Sodium**

High sodium intake will lead to hypertension, which in turn leads to cardio vascular disease and probably stomach cancer.[6] It can also lead to various kidney problems.[7]

**Low intake of Vegetables and fruits**

Low intake of vegetables and fruits plays a crucial role in the occurrence of heart diseases.[1] Its low intake can also gave rise to various nutritional deficiencies and other digestive issues.[8]

**Alcohol intake**

Intake of alcohol could negatively impact cardio vascular health. It damages cardiac muscles, increases the risk of stroke, cardiac arrhythmias, acute myocardial infarction and cardiomyopathy.[1] It also leads to development of cirrhosis of the liver, pancreatitis, cancers of various organs such as mouth and pharynx, larynx, oesophagus, liver, colorectal and also haemorrhagic stroke.[9]

**Dietary modifications for prevention of Non communicable diseases**

According to WHO, a healthy diet protects from malnutrition and it prevents the risk of development of various Non-communicable diseases such as cancer, heart disease, stroke, diabetes.[2] Almost all of the dietary modifications which should be implemented are universal for the prevention of all Non-communicable diseases. Various dietary modifications are:

**Control the portion size**

Overloading the plate may lead to increased calorie intake. Use small bowl or plate to control your portions. Eat larger portions of low calorie, nutrient rich foods including fruits and vegetables. Reduce the portion of high calorie, high sodium foods. This could protect us from various non-communicable diseases.

**Adequate Fat intake**

According to WHO, total fat consumption should not exceed 30% of the total energy intake.[2] Limit the intake of saturated fats (mainly present in animal products) .The intake of saturated fats should be reduced to less than 10% of total energy intake. Food items rich in saturated fats are fatty meat, butter, palm and coconut oil, cream, ghee and lard.

Restrict intake of Trans fats. They are of two types, industrially produced Trans fats and Ruminant Trans fats. The intake of saturated fats should be reduced to less than 1% of total energy intake. Industrially produced Trans fats should be particularly avoided. Industrially produced Trans fats include baked and fried foods , pre-packaged snacks and foods such as frozen pizza, pies, cookies, biscuits, wafers, cooking oils and spreads.Ruminant Trans fats include meat and dairy foods from ruminant animals such as cows, sheep, goats and camels.

Adequate intake of unsaturated, monounsaturated and polyunsaturated fats. Small amount of monounsaturated and polyunsaturated fat are beneficial to health. Monounsaturated fats are believed to reduce LDL level and polyunsaturated fats help in lowering blood cholesterol levels.[3] Sources of these fats are nuts, fish, seeds and vegetables.

Increase the intake of essential fatty acids omega-3 and omega-6 containing foods such as Oily fish, nuts and seeds.

**Sodium, salt and Potassium**

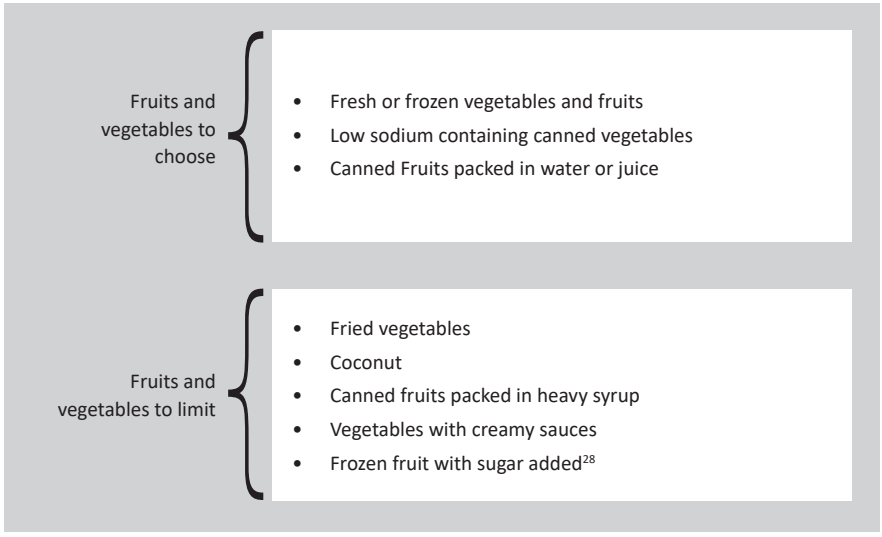
According to WHO, salt intake should be restricted to less than 5g per day (one teaspoon), which corresponds to intake of sodium less than 2g per day.[2] High intake of sodium and inadequate potassium intake are predictors of high blood pressure.[2] The measures to be taken are:

- Reduce the amount of salt while cooking and preparation of food
- Do not add additional salt in the cooked food
- Restrict the use of high sodium containing food items such as soy sauce, fish sauce
- Limit the use of dried fish, pickles and pappads
- Limit the intake of salty snacks such as chips
- Consumption of fruits and vegetables could facilitate intake of potassium, which could mitigate the negative impact of elevated sodium on blood pressure.[2]

**Fruits and vegetables**

Vegetables and fruits are rich sources of vitamins and minerals. Intake of vegetables and fruits will help to limit the intake of high calorie foods and snacks. Intake of fruits and vegetables protect us from heart disease and stroke. According to WHO, it is advised to eat at least 400g (5 portions) of fruits and vegetables per day to prevent the occurrence of various Non-Communicable Diseases. They contain various components such as potassium, fibre which are essential for maintaining good cardio vascular health status of an individual. It excludes potato, sweet potato, cassava and other starchy roots.[2]

- Include vegetables and fruits in meals
- Keep washed fruits and vegetables, cut it and keep it in refrigerator for quick snacks
- Eat vegetable salads or fruit instead of oily or sugary snacks
- Include locally available fruits or vegetables as per season
- Include legumes such as baked beans, soybeans, lentils in your diet.




**Whole grain cereals**

Whole grain cereals are unprocessed or unrefined ones in which bran or germ is not removed. They contain folic acid, vitamin D and dietary fibre which are essential nutrients for regulating blood pressure and for the protection of cardio vascular health. It also prevents other non-communicable diseases.

| Products to choose | Products to limit or avoid |
|---|---|
| • Whole wheat flour | • White, refined flour |
| • Oats | • White bread |
| • High fibre containing cereal with 5g or more fibre in one serving | • Cornbread |
| • Brown rice | • Muffins |
| • Barley | • Frozen waffles |
| • Whole grain bread preferably 100% whole wheat bread or 100% whole grain bread[4] | • Biscuits |
| • Unprocessed maize | • Cakes |
| • Millet | • Buttered popcorn[4] |

**Limit Free sugar**

Intake of free sugars has to be reduced to less than 10% of energy intake by children and adults. Limit the intake of foods and drinks which contain high amounts of sugar such as candies, sugary snacks, and sugar sweetened beverages.[2]

**Avoid or limit alcohol**

As we have discussed earlier, alcohol is very harmful to our cardiovascular health. Try to avoid the intake of alcohol. If you still want to drink alcohol, do not have more than 2 standard drinks per day. One standard drink is 375 ml mid-strength beer, 100 ml wine or 30 ml spirits.[3]

**Conclusion**

Proper dietary habits are essential to protect from various non-communicable diseases. It promotes sleep and will make people feel better. Adequate control over tasteful food items can aid you to stay healthy in future.

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**INFORMATION FOR AUTHORS**

Development is the significant parameter of child health. Adolescent development envisages the normal physical, emotional and social, psychological, sexual, recreational and spiritual changes that occur during adolescence. With this broad framework and interdisciplinary background, we bring out the journal, 'TEENS' to the domain of knowledge covering child and adolescent health.

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The manuscripts, preferably reports of clinical work, studies relating to physical, emotional and social, psychological, sexual, recreational and behavioural problems of child & adolescent care and development in the state of Kerala and the country as well are acceptable. The length of contributions should be in the range of 3000 to 4000 words and should be original. Manuscripts should be typewritten and double spaced. Submit the electronic version of the manuscript via email/CD along with the hard copy. Upload the text, tables and figures as separate files. Manuscripts and editorial correspondences should be addressed to:

Dr. Babu George, Editor-in Chief, TEENS, Child Development Centre, Medical College P.O, Thiruvananthapuram 695 011.email: cdckerala@rediffmail.com.

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The title page should include title of the article, subtitle if any, the name by which each author is known along with the highest academic degree, institutional affiliation, name, address and email of the author for correspondence, etc.

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The abstract should follow the title page. This should be a structured condensation of the work not exceeding 250 words for original research articles and 150 words for short articles. It should be structured under the following headings: background, objectives, methods, results and conclusions. It should provide the context or background for the study and should state the study's purpose/objectives, basic procedures (methodology), main findings (giving specific effect sizes and their statistical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations. Please do not make any other heading. Authors should also identify and provide 3 to 10 keywords or short phrases.

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Provide a context or background for the study. State the purpose and summarize the rationale/ objective for the study or observation.

**Materials and Methods:**

It should include and describe the following aspects.

The Methods section should include only information that was available at the time the

plan or protocol for the study was being written; all information obtained during the study belongs in the results section.

Selection and description of participants: Describe your selection of the observational or experimental participants clearly, including eligibility and exclusion criteria and a description of the source population. Since the relevance of the variables such as age and sex to the object of research is not always clear, authors should explain their use when they are included in a study report. The guiding principle should be clarity about how and why a study was done in a particular way.

Technical information: Identify the methods and procedures in sufficient detail to allow others to reproduce the results. Give references to established methods, including statistical methods; provide references and brief descriptions for methods that have been published but are not well-known; describe new or substantially modified methods, give the reasons for using them, and evaluate their limitations.

Authors submitting review manuscripts should include a section describing the methods used for locating, selecting, extracting, and synthesizing data. These methods should also be summarized in the abstract.

**Results**

Present the results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat all the data in the tables or illustrations in the text; emphasize or summarize only the most important observations. Extra or supplementary materials and technical detail can be placed in an appendix where they will be accessible but will not interrupt the flow of the text, or they can be published solely in the electronic version of the journal.

Restrict tables and figures to those needed to explain the argument of the paper and to assess supporting data. Use graphs as an alternative to tables with many entries; do not duplicate data in graphs and tables. They are to be sequentially numbered with self-explanatory captions. Results are to be presented in logical sequence in the text, tables and illustrations.

**Discussion**

Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other information given in the Introduction or the Results section. For experimental studies, it is useful to begin the discussion by summarizing briefly the main findings, then explore possible mechanisms or explanations for these findings, compare and contrast the results with other relevant studies. Link the findings with the goals.

**Conclusion and policy implications**

State the limitations of the study, and explore the implications of the findings for future research and the policy implications.

**References**

Bibliographical references should be placed at the end of each article. The references should be numbered in Arabic numerals in parentheses in the order in which they are cited in the text. Style and format of the citations should conform to the style accepted either by 'Vancouver convention' or by 'Index Medicus' of U.S National Library of Medicine. Entries are to be listed double spaced. The order of bibliographic elements in the reference vary with the type of references which include journal articles, books, edited books/ chapters in books, websites,etc. Please see some examples:

Hill A, Short MA, Varghese C, Kusumakumary P, Kumari P, Morgan GJ. The t(12;21) is underrepresented in childhood B-lineage acute lymphoblastic leukemia (ALL) in Kerala, South India. Haematologica. 2005;90:414-6.

Greenough A. Pleural effusions. In: Greenough A and Milner AD, editors. Neonatal respiratory disorders, 2nd ed. London: Arnold Publication, 2003. p.355-64.

Institute for Clinical Systems Improvement. Health care guideline: preventive services- children and adolescents. Bloomington, 2002. Available from: www.ICSI.org. [Last accessed on 2015 Jan 31].