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Pediatric Education and Research
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Measles has Killed but What Next in the 21st Century?

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The name *Rubeola* derives its name from Arabic, meaning thereby *Red spots* [1]. The name Morbilli was derived from Italian word Morbillo [2]. Home established measles as an infectious disease in 18th century. Another worker Withering in 1792 reasserted that the difference of measles with small pox existed. Recognition of the *measles* as a separate entity from *German measles* dates back to early 19th century. Panum was the first worker who did classical studies on the epidemiology of measles in Faroe Island in 1847. Measles virus was isolated from eleven years old boy named David Edmonston in USA in 1954 (Enders et al: 1954). The Kopliks spots **w**hich are absolutely pathognomonic of the invasion of the measles were described by Koplik in 1896 [3].

Before active immunization was available, epidemics of measles used to occur in the cyclical trend of two to three years during spring months and before the age of fifteen years 95% of the population used to suffer from the disease. Typically, a disease of children, it may occur at any age in the remotest isolated communities if the disease is introduced for the first time. These epidemics in the virgin population are accompanied by high mortality rate. Outbreaks in Faroe Islands in 1846 and in Fizi Island in 1875 are examples of this type of transmission. There are a number of other examples of such type of virgin epidemics and the highest mortality rate, as Greenland had its first exposure in 1951 and the epidemics affected as high as 99.9% of the indigenous population (Christensen et. al; 1952). According to WHO report, in the absence of immunization, 90% of the persons can be expected to develop clinical measles sometimes in their life time as noted in Greenland in 1951 epidemic [4].

Measles was the captain of childhood deaths and diseases globally hardly 30 years ago. More than 1 million measles-related deaths per year was almost certainly an underestimate. Pediatric wards in the developing world were flooded with patients with measles and its complications, and measles continued to be a major cause of blindness globally. In 1980, routine immunizations, including a single dose of measles vaccine, to the poorest countries of the world produced remarkable results, culminating in the achievement of the global Universal Childhood Immunization goals in 1990 and thereafter, introduction of the second dose of measles revolutionized in containing the morbidity and mortality related to measles in low, middle and high income countries. Obviously, there was a visible shift of the cases in higher age group [5]. Regardless of what the true mortality rate was in 2000, there is no doubt that by 2008 global measles-related deaths had declined markedly, to an estimated 164,000. Measles-control activities had been outstandingly successful. It appeared to be only a matter of time before the world could feasibly take on the task of measles elimination to eradication [6].

In most countries, the incidence of disease is highest among children in the first year of life, whereas the proportion of cases occurring in children older than 5 years of age and in adults varies from country to country. Infants under 9 months of age

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are traditionally regarded as too young to be vaccinated. Increasingly, however, babies are being born to mothers with minimal measles immunity, often owing to minimal natural boosting after childhood immunization. Such mothers pass less-protective immunity to their infants, who are therefore protected for a shorter period, and it has been proposed that these infants be vaccinated at a younger age. A recent trial of measles immunization at 4 months of age in Guinea-Bissau showed adequate protective efficacy. If these results can be replicated elsewhere, it would be appropriate to revisit the recommended age of first measles vaccination in order to close the current window of susceptibility.

The measles vaccine used now in India is a live attenuated strain of measles virus, the immunity of which is lifelong [7]. However, these vaccines are not 100% effective. In countries where immunization is undertaken at 12-15 months of age, measles vaccine efficacy ranges between 90% and 95%. In India, where the first dose is given at 9-12 months of age, the vaccine efficacy is approximately 85%. Although measles immunization is an effective strategy to prevent the cases, outbreaks can continue to occur especially in densely populated areas such as urban slums, even with the good coverage. The effective vaccination has reduced the incidence in children and the adolescent groups are affected.

Fig. 1: Immunization coverage status of Polio, DPT, BCG and Measles in India from 1980 to 2002

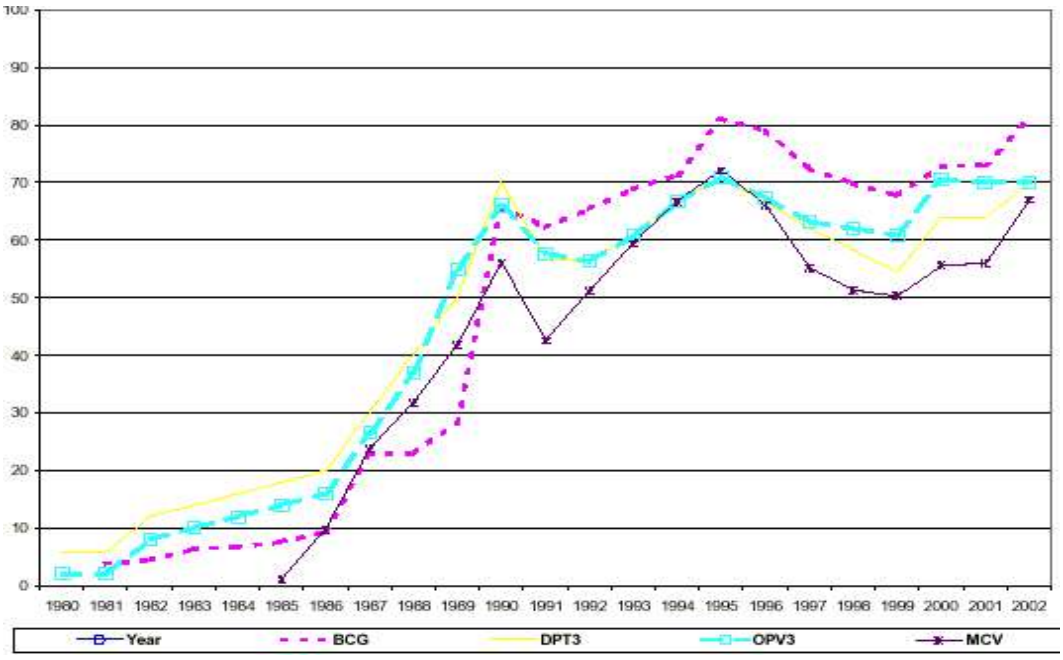
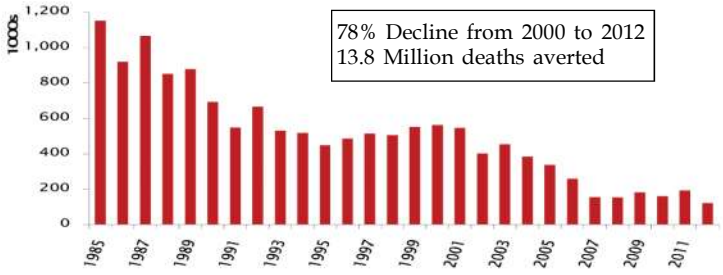


Fig. 2: 90% reduction in estimated measles deaths, 1985 - 2012



Source: WHO/IVB estimates, February 2014

Though major age group involved is 1 to 14 years, infant measles is also reported [8, 9, 10]. Measles mortality is the highest in the malnourished populations [11]. Although global immunization coverage increased from less than 20% in 1983 to 80% in 1990 and the number of reported cases of measles declined from over 4 million per year to 0.7 million in 1997, but still the case fatality ratio ranges (from 0.1 to 30 % in outbreaks among high-risk population in various countries [12]. The lack of

reliable surveillance data and understanding of local measles epidemiology makes it difficult to fully appreciate the public health burden in India and to organize targeted measles morbidity and mortality reduction strategy.

The largest percentage reduction in estimated measles mortality during 1999-2005 was in the Western Pacific region (81%), followed by Africa (75%) and the eastern Mediterranean region (62%). Africa achieved the largest total reduction, contributing 72% of the global reduction in measles mortality [13]. However, by 2015 reduction of target is 95%. So we are still substantially short of this to go to the target date**.**

The graph reflects the estimated number of measles deaths worldwide for the time period from 1985 through to 2012. While there is an impressive 90% decline looking over the whole time period, there was a 78% reduction during the period 2000 to 2012. During this period alone it is estimated that 13.8 million deaths were averted through measles vaccination.

By 2008, the WHO and partners were struggling with polio eradication, which they had missed their 2000 global target. On scientific and public health grounds, the feasibility, desirability, and timing of measles eradication should not be dependent on the ongoing polio-eradication effort [14]. In practice, however, the two efforts are inextricably linked. Because the same donors that fund polio-eradication programs will be called on to support measles eradication, the shifting of resources could jeopardize polio eradication efforts. Some argue that if polio eradication is really feasible, it should be completed before measles-eradication efforts are launched; yet by 2008, continuing polio transmission in Afghanistan, Nigeria, Pakistan, and re-emergence in other countries where the virus was endemic was leading to growing skepticism about the feasibility of eradication.

Although global measles control seems to be struggling, the polio situation is looking somewhat more promising. On January 13, 2012, India reported that it had been 12 months since the last wild-virus poliomyelitis case was confirmed in that country. Now India has officially declared 'Polio Free' by the World Health Organization in 13th January, 2014. It is one of the 11 countries in the South East Asian region which have been certified as wild polio virus free countries. A 2.3 million strong team of polio volunteers and 150,000 supervisors worked day and night to reach every child. However, 2014 saw increased numbers of new polio cases in Pakistan (306-Wild Polio Virus/WPV), Nigeria (6/WPV), and Afghanistan (26/WPV), according to the Global Polio Eradication Initiative. Polio eradication remains an elusive target, although there is growing optimism that it may eventually be achieved.

Global Polio Eradication Initiative (Polio this week as of 15 July 2015)

(http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx)

Table 1: Wild polio virus type 1 and circulating vaccine-derived poliovirus cases

Total cases	Year-to-date 2015		Year-to-date 2014		Total in 2014	
	WPV	cVDPV	WPV	cVDPV	WPV	cVDPV
Globally	33	9	122	29	359	55
- in endemic countries	33	1	107	29	340	52
- in non-endemic countries	0	8	15	0	19	3

Table 2: Case breakdown by country

Countries	Year-to-date 2015		Year-to-date 2014		Total in 2014		Onset of paralysis of most recent case	
	WPV	cVDPV	WPV	cVDPV	WPV	cVDPV	WPV	cVDPV
Pakistan	28	0	94	16	306	22	30-Jun-15	13-Dec-14
Afghanistan	5	0	8	0	28	0	07-Jun-15	N/A
Nigeria	0	1	5	13	6	30	24-Jul-14	16-May-15
Somalia	0	0	4	0	5	0	11-Aug-14	N/A
Equatorial Guinea	0	0	4	0	5	0	03-May-14	N/A
Iraq	0	0	2	0	2	0	07-Apr-14	N/A
Cameroon	0	0	3	0	5	0	09-Jul-14	N/A
Syrian Arab Republic	0	0	1	0	1	0	21-Jan-14	N/A
Ethiopia	0	0	1	0	1	0	05-Jan-14	N/A
South Sudan	0	0	0	0	0	2	N/A	12-Sep-14

If and when that occurs, the overall financial costs plus the opportunity costs will have exceeded the initial estimates many times over — a point that is not likely to be lost on funding agencies. These figures will be essential for calculating realistic costs of measles eradication, which should be analyzed and weighed against the substantial future health and economic benefits such an initiative could bring. In the shorter term, however, until greater measles control is achieved, particularly in Western Europe and Africa, health professionals in the United States and elsewhere those countries which have reached elimination stage, a pool of the susceptible would collect over the period of time and thereby those countries due to imported measles virus can anticipate more small but scattered outbreaks, mind it not the bigger ones among susceptible groups [5].

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Original Article

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Beliefs and Misbeliefs Regarding Breast Feeding

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Abstract

Though breast feeding is continued through ages, myths regarding breast feeding practices still continued. We conducted a questionnaire based cross-sectional study in our institute. In our study we found that Partial breast feeding practices predominate over exclusive breast feeding practices, Myths regarding colostrum exist in todays era also Various factors correlates with non adherance for exclusive breast feeding like; education of mother, socioeconomic status, working mothers, use of prelacteals, use of pacifiers, proper initiation of breastfeeding, type of fding to previous child, frequency of night feedees.

Keywords: Colostrum; Socioeconomic status; Prelacteals; Pacifiers.

Introduction

Breast milk is also called as white blood in "holly Quran e sharif". Though its importance is known from ancient times, misbeliefs regarding breastfeeding practices continue.

The world health organization and UNICEF declaration on the protection, promotion and support of breastfeeding recommends "exclusive breastfeeding from birth to six months, continued breastfeeding in the second year; appropriate weaning foods at about six months" [1].

Infant mortality rate (IMR) is regarded as an important sensitive indicator of health status of a community. It reflects the effectiveness of interventions for improving maternal and child health in a country [2]. Major part of IMR is contributed by a neonatal mortality rate. It has been said that 50 % infant deaths occurs within the neonatal period [2, 3, 4]. In countries like India the major killers are malnutrition, acute respiratory infections and diarrhea [5, 6]. Mother's milk is best milk for a neonate. Breastfeeding has long been recognized to have anti infective and anti-immuno-modulating effect on infant besides its nutritious value [7, 8].

Exclusive breastfeeding (EBF) is the most natural and scientific way of feeding infant in the first 6 months of life [9]. BF can contribute to the reduction of mortality and morbidity [5]. But in spite of continuous education regarding BF, most of mothers do not adhere to these practices. The present study is aimed to determine BF practices and factors influencing it in a mother.

In the early 1970's a decline in breastfeeding was documented in almost every country that was evaluated in the developing world [10]. Recent studies [11-13] in India have also shown a declining trend of breastfeeding especially in the urban slums [12].

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Our aims of study were:

1. to study misbeliefs regarding breast feeding practices.
2. to determine factors influencing for non adherence of exclusive breast feeding.

Objectives

1. to know time for initiation of breastfeeding and reasons for its delay.
2. to compare schedule and on demand feeding on the basis of total period of breast feeding.
3. to know reasons for insufficiency milk .

Material and Methods

It was observational questionnaire based (cross sectional) study conducted at dept., of pediatrics, MIMSR medical college and Y.C.R. hospital, Latur for 9 months of duration after ethical approval.

Total 168 mothers were interviewed. A validated questionnaire was filled out by asking questions to the mothers who delivered at our hospital and those mothers attending OPD for vaccination of child during the study period. Those who denied informed consent were excluded from study. Statistical analysis was done using R- programing and p values were calculated.

Results and Observations

- We found exclusive breast feeding was just 36% where partial feeding & top feeding 60% and 4% respectively. Percentage of bottle feeding was 10.2% (fig.1).
- Total percentage of delay in initiation of breast feeding was 22.6% (38 mothers). 31 mothers who delayed initiation of breast feeding continued with partial breast feeding in future.
- Reasons for delay in initiation of breast feeding were, majority that is 58% mother delayed breastfeeding because of myth regarding colostrums, 24% because of LSCS and only 18% due to NICU admission (fig.2).
- Extent of supplementary feed was 64%, reasons being for the same were in descending order were feeling of insufficiency of milk in 54% mothers, 20% mother felt it was easy to habituate the baby, 13% because of relatives pressure, 7% mothers started supplementary feed because they were working mothers and in 6% because of other reasons like maternal illness, breast discomfort, breast rejection, child illness.
- We studied correlation between the type of feeding and socioeconomic status according to Kuppuswami classification. It was proved statistically that percentage of exclusively breast feeding was higher in higher socioeconomic classes (fig. 3).
- Type of breastfeeding was also guarded by education of mother. We found that mothers having completed their graduation and higher secondary education preferred exclusive breast feeding as compared to less educated mothers (fig. 4).
- In our study 73 mothers were working and 95 mothers were homemaker. 53 homemaker mothers opted for exclusive breast feeding whereas only 7 working mothers given exclusive breast feeding to their baby.
- We found that higher percentage of mothers who have given adequate spacing (that is 3 years between two births) given exclusive breast feeding (fig. 5).
- Out of 89 mothers who delivered the baby normally, 52 preferred exclusive breast feeding and 79 mothers who have underwent LSCS , 64 given partial breast feeding.
- Those mothers who used pre-lacteals and pacifiers given partial breast feeding to their babies.

Conclusions

- Partial breast feeding practices predominate over exclusive breastfeeding practices,
- Myths regarding colostrum also exist in present time,
- Various factors correlates with non-adherence for exclusive breast feeding like; education of mother, socioeconomic status, working mothers, use of pre-lacteals, use of pacifiers, proper

Fig. 1: Types of feeding

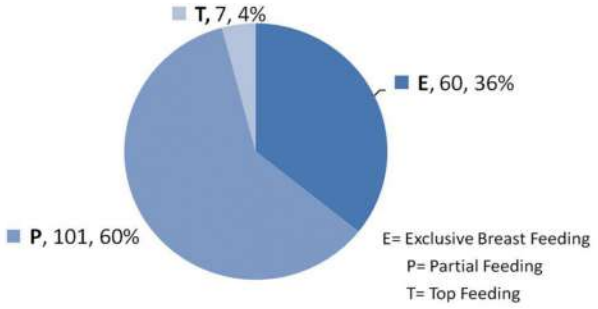


Fig. 2: Reasons for delay in initiation of breastfeeding

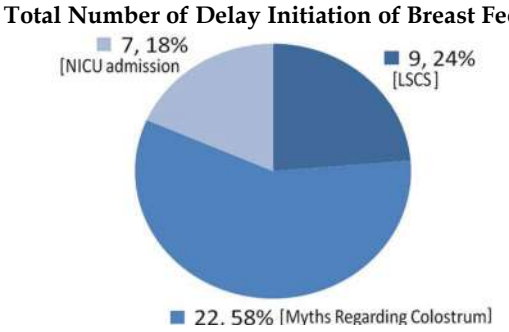
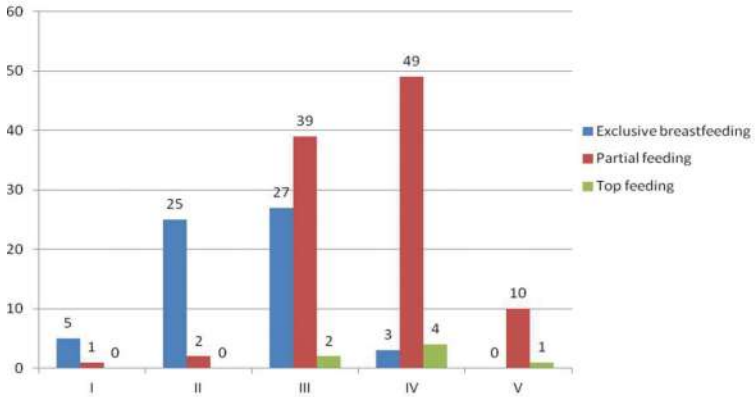


Fig. 3: Type of feeding vs. socioeconomic status



P value = 9.344e-13

Fig. 4: Type of feeding vs. education status of mothers

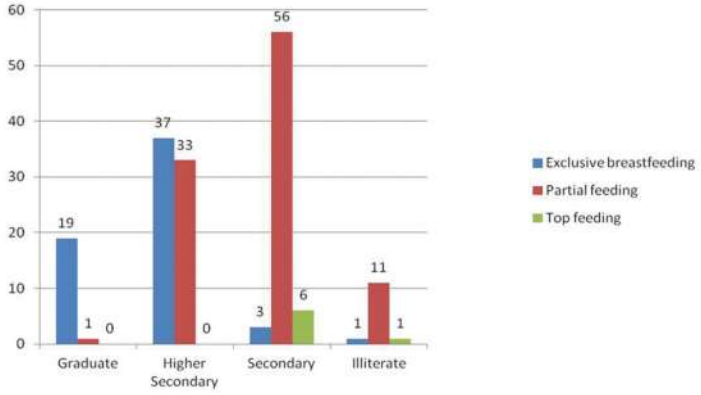
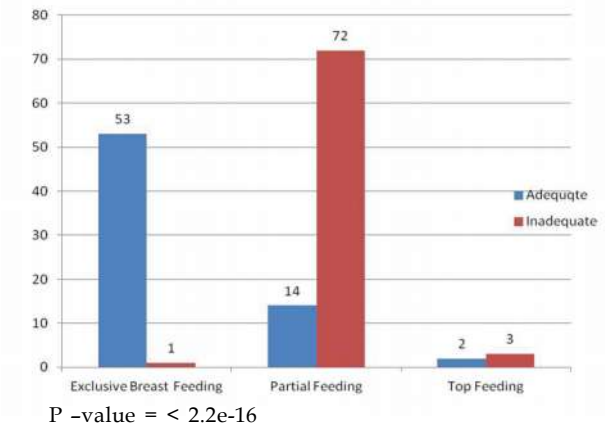


Fig. 5: Type of feeding vs. spacing



P –value = < 2.2e-16

initiation of breastfeeding, type of feeding to previous child, frequency of night feeds.

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Original Article

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Reaction Time in Children by Ruler Drop Method: A Cross-Sectional Study Protocol

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Abstract

Background: Reaction time (RT) is the time interval between stimulus and response. RT can be measured by ruler drop method (RDM). Till date, there is no set standard reference norm available for the school children by RDM. *Objective:* To determine the standard reference norms for RT in school going children. *Methods:* A sample of 152 students will be recruited based on predetermined set of inclusion criteria from the recognized primary school by convenience sampling method for the cross-sectional study. RT of all the recruited students will be estimated by RDM. *Statistical analysis:* Normality of the collected raw will be established by Kolmogorv Smirnov test of normality. Descriptive statistics will be used to report the standard reference norms of RT in mean (standard deviation). Independent t-test or Mann Whitney U test will demonstrates the gender differences of RT by RDM among the primary school children. *Conclusion:* This study will act as the foundation for other studies using RDM for reporting RT.

Keywords: Normal Value; Reference Value; Response Time; School Children; Standard Norm.

Introduction

Reaction time is defined as interval of time between presentation of stimulus and appearance of appropriate voluntary response in a person [1]. It varies with number of possible valid stimulus, type, order and intensity of stimulus, arousal, age, gender, physical fitness, hand dominance, practice and error, fatigue, fasting, distraction, alcohol, finger tremor, stress, drugs, intelligence, learning disorder, brain injury, illness, personality type, accuracy in hearing and vision [1, 2].

Lesser the reaction time it multiplies ones achievements in many areas such as, sports, academics, music, dance, driving, defense, etc. By identifying the person's reaction time, we can predict reacting abilities in the above mentioned situations. In case of children, this helps us to identify the children with prolonged reaction time and to identify the cause. Thereby individual attention can be given to these children at their younger age. Thus estimating the reaction time of children at their younger age is more prior.

In the human life the age between 6-11years are the rich years filled with growth and more remarkable changes in executive attention occurs between 6 and 8 years of ages where they make a move towards adulthood from their childhood [3, 4]. At the age of six years the child shows remarkable shift in the cognitive skills [5] which includes perception memory, intuition, awareness, reasoning, attention, judgment, and initiation-termination of activities [6]. These cognitive changes transform the body and mind of a child along with biological and psychological changes [7]. So, if reaction time norms for children are estimated during these age span,

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identifying the children deviating from these norms would be made easy.

Reaction time of an individual is estimated clinically by computerized neuropsychological test [8]. But high cost and professional guidance in estimating reaction time makes this unavailable for the school children. Though mobile based android applications are available for estimating reaction time, but the restricted usage of mobiles at schools makes this as a tough task. Thus there is a desire need to develop reference standard norms for RT using simple instrument used in schools like Ruler.

Eckner et al validated his simple instrument for the estimation of reaction time [9]. But the instrument has ceiling effect and in case of children it might have major effect. To minimize this effect, we have proposed a simple method to estimate reaction time by a ruler dropped at least a meter distance from the ground. A stainless steel meter ruler is used in the study to estimate the reaction time in the children [10].

Review of literature

Reaction time (RT) is defined by various authors in multi-ways. RT is an interval of time between presentation of stimulus and appearance of appropriate voluntary response in a person [1]. Also defined as 'the interval of time between application of stimulus and detection of a response [11]. It measures the cognitive functioning of an individual [12-14]. This reaction time mainly depends on the type, number and duration of possible stimulus [2].

The first clinical examination of RT was performed by a psychologist F.C. Donders in 1868. He defined RT as the Speed of Mental Processes and assessed by means nerve conduction velocity using 'subtractive method'. Here he gave electric shock to both feet of the subject randomly as a stimulus to infer how much time was needed for comparing the tasks, such as identification, comparison or other higher-level judgments. The subject responded to the stimulus by pressing the telegraph key with his left or right hand with respect to the leg in which the shock is received [11, 14-16]. Many studies were carried out by different investigators to find RT by using Donders's subtractive method but the obtained RT was varied from person to person and laboratory to laboratory [14].

Later in the year 1930 the 'father of modern psychology' William Wundt, along with his students, extended the subtractive method into experimental psychology and also they found a new application where RT was evaluated once the stimulus was identified through which they measure the duration of mental processes, attention, memory, and the integration of the ideas. They estimated attention or apprehension span in the form of result [14, 17].

In the year 1938 Julia from the University Minnesota found the relation of RT of 5 year old children to various factors by using Mill's reaction board with accessory key and she is aimed to find the speed of reaction to auditory stimulus in relation to their sex, intelligence and work status. In this study she selected 50 girls and 50 boys of age five year five month to five year seven month. During procedure the main board of apparatus was held by experimenter and the part was placed in front of the child. The Experiment was consisted with 25 trials in which the children were divided into of group of five trials and first three group of tests performed with the rest of 15 min; the fourth and fifth groups of tests conducted with the rest of 30 seconds each [18].

Sternberg et al introduced a new method for calculating RT known as 'additive factor method' to overcome limitation of Donders and other methods. It explains the stages of information processing. In this method the stimulus was given by a sequence of visually presented digits ranging from zero to nine. The subject will give either positive response or negative responses [14].

There was a major shift of cognitive behavior from operational orientation after the World War II. The philosophical adjustment leads to evolution of computerized batteries in calculation of RT in 1970-80s, hence these years are known as golden years [19, 20]. Various studies were performed to evaluate RT by using computer.

In the year 1972 Spring et al performed a study Reaction Time in Learning-Disability and Normal Children. They estimated the RT of 22 children with poor reading and 22 children with normal reading, aged between seven to 12 years and IQ of 94 to 130 by pressing one switch of corresponding letter when two upper-case letters were presented simultaneously. 80 trials were given prior and again 40 trails were given after the rest of ten minutes. At last they concluded that the children with learning disability show longer RT when compared to normal children [21].

RT was also assessed by using the mobile phone with test battery installed. Kaisa Rolig in her thesis estimated the feasibility mobile phones in the calculation of RT. Now a day mobile became an important part of life hence it reduces cost effective for the subjects. The subject can repeat the

measurement whenever required. But these measurements are varied from laboratory measurement with controlled environment also the structure each models of phones and their software's are varies from one another. There is also comparatively small screen and buttons when compared with computer [19].

Ruler drop method (RDM) is another simplest method to estimate the RT. Subject/athlete was asked to perform RDM by sitting with their dominant forearm resting on a flat horizontal table surface, with their open hand at the edge of the surface. The examiner/assistant was suspending the ruler vertically such that the other end of ruler was aligned with the top of the subject/athlete open hand. When the examiner/assistant releases the apparatus, the subject/athlete should catch it as quickly as possible. Then the distance travelled by the ruler is the converted into time by the formula $d = vt + \frac{1}{2}at^2$ [22].

Eckner et al validated this RDM through his observational study on evaluating a clinical measure on RT, where he evaluated the RT of 65 healthy individual with mean age 45.5 years and right hand dominants by RDM. They found excellent inter-rater (ICC= 0.92) and test-retest (ICC = 0.86) reliability also they calculated RT by using a software of simple reaction time task developed using E-Prime which was installed in a personal laptop for validation of RDM. The participant were asked to sit in front of computer such that their dominant forearm should rest on the laptop keypad and they have to press space bar as the black circle on the white background on the computer screen was changed to a black randomly at the time interval of 4-15 seconds. Time interval between stimulus and pressing the button was recorded by computer in milliseconds. Feedback was given after the each trial [9].

Later Eckner et al evaluated the RT of Division I Football Players from National Collegiate Athletic Association by RDM. He selected Cog State Sport tests passed 68 athletes aged between 18-23 years. The study was aimed to compare RT by RDM (RT_{clin}) with RT by computer (RT_{comp}) with neuropsychological test battery installed. This computer monitor consist playing cards in the middle with inverted face. Athletes should press the key 'K' as quickly the card turns upward. And they conclude that there is a positive correlation between RT_{clin} and RT_{comp} (r =0.44) [20].

S. S. M. Fong et al was conducted a study to compare the physical fitness and RT of 20 Taekwondo practicing children aged between 10 to 14 years and the 20 children from the community with same age group. The RT of was estimated by RDM and the physical fitness was measured in terms of Sit-and-Reach Test, Leg-Split Test, One-Minute Curl-Up Test and Skin fold Measurements. The procedure of RDM was repeated for three times and the average of these was used for data analysis. They estimate RT of Taekwondo practicing children was 0.19 millisecond and RT of children from the community was 0.22 millisecond [23].

In our pilot study, we evaluated the reliability and validity of RT of 12 school children aged between 6-10 years by using RDM [24, 25]. We used a metal ruler with one meter length. We did a small modification in the procedure that Ruler was suspended vertically such that across 5 cm was aligned with the top of the child's open hand and Distance the ruler travelled from starting 5 cm was recorded. The trial was repeated 3 times. To estimate the validity of RDM we used an android based mobile application known as criterion referenced Reaction speed®. We found good intrarater reliability (0.81) and moderate to good degree of validity (0.54) [10, 25].

Need of the study

To develop reference standard norms for RT using Ruler Drop Method

Clinical significance

RT reference standard norms could act as benchmark in comparing with age appropriate values among the school children and to determine how much they differ from their peers.

Objective of the study

To estimate the standard norms for RT in primary school going children.

Methodology

1. *Study design:* Cross sectional study
2. *Study setting*: Sports lab of respective school
3. *Sample population*: Children with typical development
4. *Sampling technique*:
   - ❖ Selection of school: Convenience sampling
   - ❖ Selection of children: Simple random sampling
5. *Sample size* n = 152
   - ❖ Estimated by the formula, $n = (Záó/d)^2$

á = 31.4 ms (from pilot study)

ó = 0.314s;

d = 0.05 (5 % error)

Inclusion criteria

- Aged between 6-12 years
- Male and female gender
- Typical development with optimum health
- Able to understand simple command

Exclusion criteria

- Uncooperative children
- Open wound, recent fracture, contracture or any nerve injury in the upper limb
- Any other condition that prevents the children from performing the test

Materials used

- Metal Ruler of 1 meter length (Camline)
- Cotton
- Insulative tape
- Chair and table
- Measuring tape (Coman®)
- Weighing Machine (WC 150)
- Other necessary stationary

Procedure

A sample of 152 children will be participating in this study during the month of October, 2014 to March, 2016 with the prior permission from the principal of participating school and also parents/legal guardians. The ethical clearance will be obtained from institutional research ethics committee of Maharishi Markandeshwar institute of physiotherapy and rehabilitation Mullana, Ambala Study will be done by the guidelines laid by ICMR (2006) and Helsinki Declaration (Revised 2013). The assent from children and consent from their parents/ legal guardians will be obtained prior to the study.

All anthropometric measurement will be taken before the initiation of study. To measure Reaction time (RT) by ruler drop method (RDM) the child will be made to sit with their dominant side elbow flexed at 90^0 with mid-pronated forearm resting on a flat horizontal table surface, with the open hand at the edge of the surface. Ruler will be suspended vertically by the examiner, such that the lower end will be aligned across 5 cm between the web space (i.e. thumb and index finger) of the child's hand. Child will be asked to catch the ruler as quickly as possible, once it is released from the examiner's hand.

Distance the ruler travelled from starting 5 cm will be recorded. Then this distance will be converted into time by using following formula.

$$t = \sqrt{2d / g}$$

Were **d** is the distance travelled by ruler **g** is the gravitational constant (9.8m/s)

Three trials will be taken, then mean of this will be used for the analysis and the test will repeated for next two sessions to estimate the intra-rater reliability.

Outcome measure

- Distance (d) in centimeters

Data analysis

Data will be analyzed by SPSS version 16.0 (SPSS Inc., Chicago, IL, USA). As our sample size is greater than 50 Kolmogorv Smirnov will be used to check the normality. Descriptive statistics will be expressed in terms of mean and ±SD (standard deviation), if data follow normal distribution, otherwise median and IQR will be used. For the reference value of RT also follows the above situation.

Significant difference between male and female will be established by independent t-test or Mann Whitney U test depends on normality of collected data. Alpha value will be analyzed at the significance of less than 0.05 to minimize type I error.

Discussion

Estimating RT by RDM might be an interesting task to the school going primary children because in RDM, a moving ruler will be held between their fingers. The task might create motivation among all the children. Competitiveness and curiosity might prevail among them in completion of the task. Moreover, the study will be the first of its kind in estimating RT by RDM among the primary school going children.

Conclusion

The reference standard norms will be reported at the end of the study. The results could act as the foundation for all other study using RDM for estimating RT. The reference value of RT among the primary school children will help the researcher to compare them with the established reference standard norms. There by ideal scale for RT would be set up in the field of research.

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- Aranha VP, Samuel AJ. A light on the literatures of reaction time from the past leading to the future – A narrative review. *Pediatric Education and Research,* 2015; 3(1): 11-4.
- Aranha VP, Joshi R, Samuel AJ, Sharma K. Catch the moving ruler and estimate reaction time in children. *Indian Journal of Medical and Health Sciences,* 2015; 2(2): 23-6.

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Review Article

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History of the Dual-Task Training in Children with or without Disabilities in the Post World War Era: A Brief Review

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Abstract

Dual-task Training (DTT) is an activity in which a person performs two attentional demanding tasks simultaneously. Many researchers have demonstrated the effectiveness of DTT in rehabilitation of persons with Parkinson's disease (PD), traumatic brain injury and other neurological conditions among adult populations. But DTT has not been explored in children with and without disabilities in the post World War Era (WWE). Hence, we present here the brief review on the history of DTT from the searched online database such as Google Scholar, OvidSP, Cochrane review, PubMed and PEDro from 1945 to 2010. This review will be a short history of DDT in post WWE.

Keywords: Cognitive Rehabilitation; Dual-Task; Postural Task; Review; Theory.

Introduction

Difficulty to maintain balance while performing more than one task has been found in individuals with various types of nervous system pathology. Postural stability declines during the concurrent performance of cognitive task and physical task such as maintaining standing balance. They exhibit greater postural sway and on the greater risk of fall. This could be overcome by the dual-task training (DTT). DTT is a rehabilitation procedure in which an individual performs two attentional demanding tasks simultaneously. The relationship between cognitive function and postural control are being studied by many researchers. This review would elaborate the history of the research done in post World War era in children with or without disabilities.

Dual-task paradigm

Several researchers have used the dual-task paradigm to study the attentional demands of maintaining an upright posture and they have chosen postural control task as primary task. Theorists have long attempted to explain the influence of attention on performance by Limited capacity theory and Selection for action theory in the past 50 years [1].

Limited capacity theory

According to Limited capacity theory (1950-1980), theorists postulated that the human brain is capable of processing only a certain amount of information at a particular point of time [1]. Thus a person's performance is not adversely affected when a concurrent task is performed within the brain's available capacity. Dual-task interference occurs when the requirements for a certain task exceed the brain's capacity and a process of selective attention is in place as a means of allocating available resources under multitask conditions. But these theories were later shown to be inadequate and limited in their ability to predict postural behavior

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under dual-task conditions [2] and so lost their popularity.

Selection for action theory

A new theory known as Selection for action has emerged since 1980s. If two conflicting tasks are being performed simultaneously then those conditions are either modified so task can be performed or one of the task is postponed or not completed [3]. From this concept Neumann claims that the dual-task are performed concurrently using action planning where two tasks are combined into one higher order skill. Pelleechia offers support for this concept by her study. By a dual-task methodology, the researcher showed that postural sway increased with increasing attentional demands of concurrent cognitive task, with most difficult cognitive task having the greater influence on sway [4].

Dual-task in children

Researchers have focused on developmental changes in the ability to simultaneously perform various cognitive and motor tasks. In studies such as verbal-manual time sharing, both concurrent tasks have involved a motor component. For example, children have been asked to recite tongue twisters or animal names while concurrently performing manual skills such as finger tapping [5]. More complex motor skills and cognitive task combinations have used in other studies [6, 7].

Postural task and cognitive task

When dual-task methodology is used to investigate the effects of divided attention, subjects typically are instructed to give equal priority to primary and secondary task performance. Kerr and colleagues performed the first research to demonstrate attentional demands of stance postural control. Several researchers have chosen postural control tasks as primary tasks [8-11]. But all of them have focused on older adults neurological patients. Pellecchia is the pioneer in this area. She reported that postural sway increases with attentional demands of concurrent cognitive task [4]. The purpose of her study was to determine whether postural sway varied with the difficulty of a concurrent unrelated cognitive task. Participants stood on a compliant surface under four conditions of varied attentional demand. Information reduction tasks such as digit reversal, digit classification, counting backward by 3s were used to quantify the attentional demands of the cognitive activity. Results showed attentional demands of the cognitive task impacted postural sway, with the most difficult cognitive task having the greatest influence.

Dual-task training

She examined the hypothesis that following DTT, a concurrent cognitive task would not amplify postural sway. Participants (N = 18) were assigned to no-training, single-task training, or dual-task training groups. Single-task training consisted of 3 sessions in which the postural task, quiet standing on a compliant surface, and the cognitive task, counting backward by 3s, were practiced separately. DTT consisted of 3 sessions of concurrent practice of the cognitive and postural tasks. After training, performance of a concurrent cognitive task increased postural sway in the no-training and single-task training groups but not in DTT group. Results suggest that dual-task practice improves dual-task performance [1].

Recent field of interest

Blanchard along with Pellecchia were first to test the interaction between the cognitive process and motor control in pediatric population [1]. She studied the influence of concurrent cognitive tasks on postural sway in children. 19 fourth-grade students, while standing on a balance platform, were asked to stand still, count backward, and read second-grade level sentences. The AMTI Accusway System was used to calculate the length of center of pressure path (LCOP), sway range (SR), and sway variability (SV) in mediolateral (ML) and anteroposterior (AP) directions of sway. The demands of concurrent cognitive tasks while standing affect postural sway in children. The findings of their study contribute to our understanding of postural control in children and may explain why improvements in postural skills attained in clinical settings may not transfer to improved performance in other settings [1]. From then, researchers began to explore their areas of interest in pediatrics. Cerebral palsy is a field of interest for most of the recent researchers [12].

Conclusion

There is a vast development in pediatric rehabilitation using DTT in post WWE. But still there is a long way to go. More research have to be performed in pediatric conditions such as Down's syndrome, cerebral palsy, muscular dystrophy,

infantile hemiplegia, etc., using DTT. There is a lack of systematic reviews and high quality randomised controlled trials (RCT) to add high level of evidence in pediatric rehabilitation.

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Isolated Tricuspid Valve Vegetation in a Normal Child

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Abstract

Infective endocarditis is a microbial infection of the endothelial surface of the heart and since last 2 decades, the incidence of tricuspid endocarditis is increasing. Right-sided infective endocarditis accounts for 10-15% of all cases. The patients addicted to intravenous (IV) drugs and with long-term IV catheters or with antiarrhythmic devices, such as implantable defibrillators and pacemakers, have increased the risk of right-sided endocarditis. Here, we report a child with isolated tricuspid valve endocarditis without any cardiac malformation.

Keyword: Infective Endocarditis; Tricuspid Valve; Vegetation; Echocardiography.

Introduction

Right-sided endocarditis usually occurs in intravenous drug abusers and in patients receiving intensive care with peripheral and central venous catheters[1]. Other sources of right-sided endocarditis are unusual and include pacemakers, skin infections, and bacteremia in patients having congenital cardiac lesions such as left-to-right shunts. Operation is the effective treatments but there is much controversy over the indications and timing of surgery [2, 3]. We describe a case of 8year old girl, who had tricuspid valve endocarditis with structurally normal heart and no evidence of intravenous drug abuse.

Case Report

An 8 year old female child was admitted with complaints of fever and breathlessness since one month. There was no history of cough, convulsion or cyanosis. She was febrile, pale and dyspneic. Her temperature was 102°F; respiratory rate was 32/min; pulse was 100/min and blood pressure was 100/60 mmHg. JVP was raised and bilateral pedal edema was present. On auscultation, the apex beat was not displaced, and the first and second heart sounds were normal with a systolic murmur heard along the lower left sternal border. Other systemic examination was within normal limit and there were no stigmata of infective endocarditis. Investigation showed, hemoglobin of 7gm%, total leucocyte count of 8,500/cumm and differential leucocyte count: N68% L30% E2%. Peripheral smear showed microcytic hypochromic anemia. ESR was 22 in 1st hour. Fundus examination was normal. Urine microscopy was normal and urine cultures were sterile. ECG was within normal limits. Chest X-ray revealed no evidence of cardiomegaly (CT ratio: 0.5). Echocardiographic shows mobile, echogenic mass (vegetation) of 7x7 mm in size attached to the septal tricuspid valve leaflet (Fig. 1) with mild to moderate tricuspid regurgitation. The other valves were normal, and the interatrial and interventricular septa

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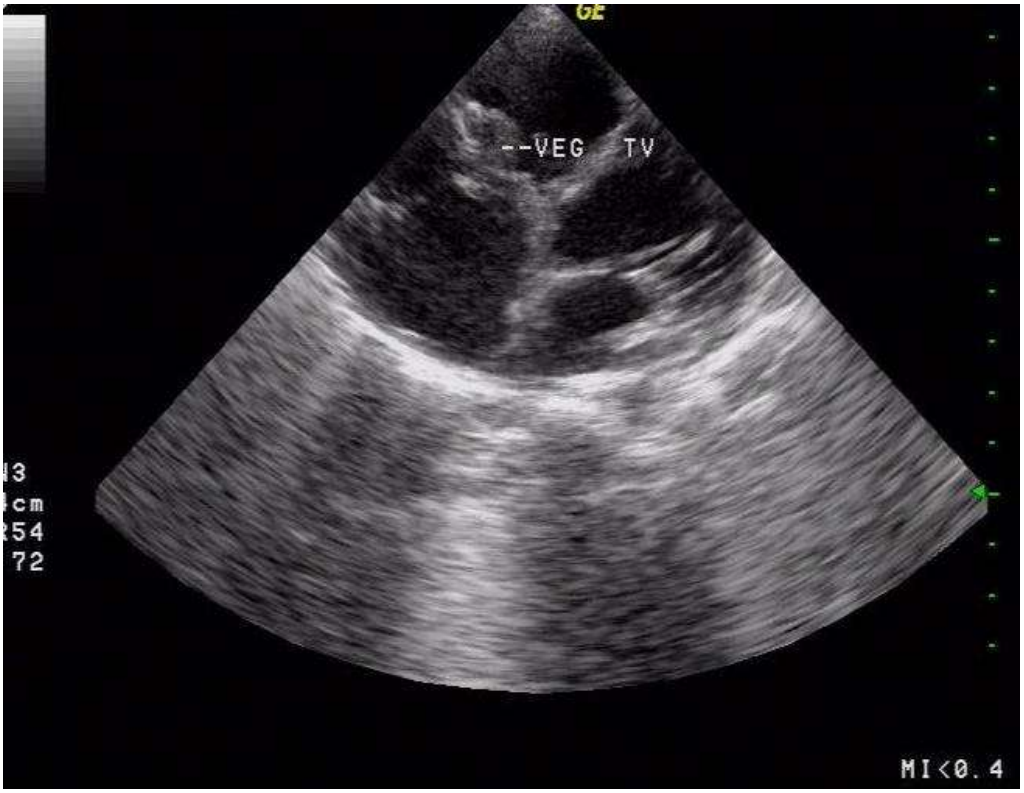
were intact. Before the initiation of antibiotic therapy, three sets of blood were taken for culture from different sites but all culture was sterile. Injection Crystaline penicillin and gentamicin therapy was started. The patient's fever was taken under control on the third day of treatment. On parent request, child was discharged 12th day after admission. Oral antibiotic therapy was continued for next four weeks. On follow up after 2 month, child was asymptomatic, afebrile, and echogenic mass size was decrease on echocardiography.

Fig. 1: Transthoracic echocardiogram shows tricuspid valve vegetations on apical view



Discussion

Infective endocarditis is a microbial infection of the endothelial surface of the heart and the incidence of tricuspid valve endocarditis (TVE) has risen dramatically during the last 2 decades [3]. TVE without any pre-existing heart disease is primarily a disease of intravenous drug abusers. Other sources of right-sided endocarditis are unusual and include pacemakers, skin infections, and bacteremia in congenital cardiac defect child with left-to-right shunts or congenitally abnormal tricuspid valves (*e.g.,* Ebstein's anomaly) [4]. TVE with normal hearts is an extremely uncommon condition in children. Naidoo DP et al [5] reported 6 cases of isolated TVE in young women. The main pathogen responsible for infective endocarditis in children is viridians-type streptococci and staphylococcus aureus, but in our case blood culture was sterile. Clifford et al [6] concluded that superficial skin sepsis is risk factor for TVE with structurally normal hearts and no evidence of narcotic abuse. The right side of the heart is less susceptible to injury from tricuspid regurgitation and pulmonary embolization than from lesions associated with left-sided endocarditis. Tricuspid valve endocarditis is caused by organisms that can be treated successfully with antibiotics. The tricuspid valve disease was significantly lead to raised jugular venous pressure and bilateral lower limb oedema which subsided with diuretic therapy [4, 7]. Our patient had no prior documented cardiac problem or a predisposition for right sided infective endocarditis. He was admitted only for persistent fever and diagnosis was made by echocardiography. The surgical treatments of TVE are valve replacement or simple valve excision without valve replacement. A third more conservative procedure consists of resection of the vegetation (vegetectomy) and leaflet repair, if necessary [8, 9]. In our case, an early surgical management was not because of the good response to initial antibiotic therapy.

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[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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