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Environmental Pollution in Relation to Child Health and Growth

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ABSTRACT

Pattern of growth and development in values some of the evolutionary physiological, cultural and mathematical pattern. It is interpreted differently by people from different fields, a cell biologist considers it in terms of a series of genetically controlled cell duplication and division events. An embryologist considers in terms of patter of cell differentiation and integration leading to the development of a functionally complete human where as biological anthropologist considers human growth in relation to evolutionary biology, biocultural factors, intrinsic and extrinsic factors such as genes, hormones etc, the physical and social environment including the implication of environmental pollution etc.

Since children don't have the same protective mechanism built in adults do for e.g., they don't have different metabolic process to break down some toxicants. Most of children have a few things in common, they play a lot, they eat a lot and they grew fast ironically the healthy way of life puts kinds at environmental risks.

The use of growth assessment as a measure of community health and under certain circumstances as a means of judging the effect of toxic materials on community health thus the present study was conducted to make an attempt to assess the child growth and health in relation to environmental pollution.

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INTRODUCTION

Normal physical growth is viewed as a sign as good health children are critical resource whose growth and well being will determine to a large extent the course of country's socio economic and demographic future therefore appraisal of the progress of a country in the field of health can be made from time to time with the help of growth studies.

Population difference in stature and weight and other physical characteristics have been documented through out the recorded history. The causes of such population differences in body size including variation in the amount of growth rates are due to genetic and environmental factors.

Genetic makeup is that cannot be altered after conception, the physical Body proportion are probably also under the influence of genetic control, the physical and mental traits of every human being are to some extent determined by the nature of his genes. Where as in environmental factors, growth can be influenced by certain conditions such as socio economic status and nutritional level are prime influences on physical human growth. Now anthropogenic feature has been added to this nature environment such pollution especially air pollution due to increment in vehicle numbers day by day and traffic problems.

MATERIAL AND METHOD

In view of environment levels of pollution it is clear that pollution is a major environmental problem and leaves a permanent scar on growing child.

The major objective of present study was to make an assessment if the level of pollution is any way interferes with the process of growth and health status of child thus on the basis of pollution level, area having higher concentration level of suspended particulate Matter (SPM) sulphur dioxide (SO_2) and oxides of Nitrogen (Nox) with respect of Lead (Pb) and noise pollution was considered as less polluted area i.e. Gomti Nagar and the area having higher concentration level of pollutants in respect of suspended Particulate Matter SPM, NOX and SO_2, Pb and noise pollution were higher than the recommended limits of NAAQS i.e. Charbagh, this area specification was done in the year 2000 on the basis of ITRC report, now presently known as IITR (Indian Institute of Toxicological Research).

Today most children live in urban environments which is polluted by vehicular exhausts smog. Etc; School age children spend a significant period of time at school, a very different physical environment than house.

Children are at increased risk because they are exposed to pollutants at critical time of their growth and development. The crawling stage of infancy, the play pattern and short stature of toddlers also serve to increase their exposure to dust and heavy exposure plus biological vulnerability makes them very susceptible to injury caused by pollutant in the environmental, Child growth is a low tech method for assessing a socially valued health outcomes and its assessment to causes attention of the early portion of the life span is easily measured and is sensitive to variety of influences chemical ones. Preschool children seem to be main victims of environmental pollution in view of the above the study on 600 children was conducted during 2000-2001, where 300 children were from less polluted area 300 from High polluted area male and female were differentiated was 30 male and 30 female from each age group.

For the convenience of the study and to evaluate the role of environmental particularly pollution level on children's growth, children of same socioeconomic status and same caste i.e. Brahmins were taken for study. Since it is mentioned earlier that several potential environments risk were particularly associated with preschool age period thus the age for this study was 3 year to 7 year and chronological age grouping was followed by "Tanner Decimal age calendar method" After getting decimal age 5 groups were made for children.

S. No	Mean Age	Decimal Range
1.	3 year	2.500-3.499
2.	4 year	3.500-4.499
3.	4 year	4.500-5.499
4.	4 year	5.500-6.499
5.	4 year	6.500-7.499

Thus in the present study some anthropometric measurements were taken for the assessment of growth. Nutrition is also known as a major factor in regulating child growth and development therefore for the differentiation between the subjects of both the area weather the children belonging to same socio economic status and same caste getting similar nutrition, a common dietary questionnaire was made for the pre enquiry about the daily dietary intake of the children.

RESULTS AND DISCUSSION

Schell (1986) " of the environmental According to factors that vary among population a major contributor is nutrition, when nutrition is a adequate or well controlled in comparison of population environmental factors including toxic materials can be noted in growth patterns and difference in growth and development can be made manifest"

In the present study, nutritional intake of the children of both the areas were almost similar even malnourishment was also negligible in both the area (some indices were also calculated for the assessment of malnourishment).

The findings of the present study indicates that children of less polluted area depicts the better results in all the anthropometric measurement i.e. Height, Weight, circumstances and diameters in comparison to male children of high polluted area. Whereas female children of less polluted area also depicts the better results regarding anthropometric measurement up to six year whereas 7 years do not depict any considerable difference (may be due to their more involvement in indoor games or activity) i.e. statistically not significant difference, The causes of this reduction in growth among the children of High Polluted area must be due to pollution, because children tend to breath more through mouth than through the nose due to their increased physical exertion, thus reducing the effectiveness of one level of filtration. In addition young children's small noses are blocked congestion, construction or other illnesses (NDRC, 2004). It is further noted children then to be outdoors in after noon and in summers which results in much higher exposure for children than adult, who are protected by indoor environment (Schwartz 2004).

Schell stated that it is possible that air exerts an effect like high attitude hypoxia, limiting oxygen available for growth. In hypoxia the partial pressure of oxygen in the atmosphere is reduced and it can lead hypoxemia or insufficient oxygen reaching the tissues, the partial pressure of oxygen in the environment affects the amount of Hemoglobin in the blood that is situated with oxygen is required for normal metabolic activity children residing in the high polluted are were more affected by the pollutants especially from suspended particulate matter, which was very high in concentration. The human nostrils filler out 99% of the inhaled large and medium sized particles. The rest may enter the windpipe and lungs where some inhalable particulates cling to protective mucous and are removed, some of the smallest particles, called respirable particulates may tend to be deposited in the alveoli (tiny air sacs in the lungs) in the lungs, particulates slow down the exchange of oxygen with carbondixide in the blood

causing shortness of breath. The heart get strained because it works harder to compensate for oxygen loss, Thus in the present study conclusion indicates that children of high polluted area are uniquely vulnerable than the children of Less polluted area. The finding also suggest the health related problems such as breathing, coughing etc. are more common in the children of high polluted area according to Schell (2000) i.e. we clean up the environment child growth will be little affected by air pollution but i.e. children grow up in an environment with many types of pollution, the effect of all the pollutions together may be large.

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