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Research Article

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PREVALENCE OF MALNUTRITION AND ASSOCIATED RISK FACTORS AMONG URBAN AND RURAL POPULATION OF MEERUT

(U.P.)

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ABSTRACT

Malnutrition is a heterogeneous group of disorders with wide spectrum of manifestation resulting from deficiency of both proteins and calories in varying amounts. The two extreme forms of malnutrition, kwashiorkor and marasmus occur at either end of the spectrum and in between them varying degrees of signs, each are found mixed together. Present study refers to urban and rural integrated health in Meerut region, Uttar Pradesh. The aim of this study was to find out association, if any between social factors viz; age, sex, rural or urban area, marital status, income and education with reference to

malnutrition A stool examination was performed on 128, randomly selected persons from urban and rural populations of Meerut District. The present study was carried out from 2006 to 2009 in the department of zoology, Meerut College, Meerut. The collected stool specimens were examined microscopically using simple smear in saline method and blood samples were also collected for biochemical and hematological examination from the urban and rural population of Meerut District. Student's 't' test for unpaired samples was used to analyze the data for statistical significance performed to the test for an association between all possible pairs of malnutrition and between the genders of each age group. The values express as mean \pm SE (n = 5) and Hb, RBC, PCV, MCV DLC (Lymphocytes and Eosinophil) values were significantly different from control. The present study would be helpful to understanding of relationship between these factors helping in planning and execution of an effective strategy directed to eliminate the diseases in highly endemic area.

KEYWORDS: Malnutrition, Nutritional Status, Prevalence, Poverty, Epidemiology.

INTRODUCTION

Malnutrition is an important factor contributing to illness and death. During malnutrition, childhood can also affect growth potential and the risk of the morbidity and mortality in later years of life. Insufficient proteins and vitamins in the body, which affect the growth, development as well as resistance, thus leading to many illness. In turn, people become malnourished and enter the vicious cycle of malnutrition. Most commonly malnourished people and children either do not have enough calories in their diet or are eating a diet that lacks protein, vitamins or trace minerals. Malnutrition may be caused by health conditions that increase the amount of calories or nutrients need. The malnutrition directly affects the immunity of the persons. The population belonging to undeveloped countries and weaker section suffer from malnutrition are weakened physically and mentally. These population also become susceptible to various infectious diseases and sometimes if untreated they die. Malnutrition is the most important nutritional problem due to various combinations of protein and calorie deficiency in the developing countries throughout the world. It is outcome of many factors that include physical, social and cultural factors. The severe forms kwashiorkor and marasmus are the leading killers of our paediatric population. Malnutrition among children is known to cause permanent stunting besides affecting their mental performance. There are many factors that directly or indirectly cause malnutrition among children. Researchers have found "Child Malnutrition" as cause of combination of inadequate nutrients, in appropriate food intake, gastrointestinal parasites and other childhood diseases with improper care during illness [Mishra and Ratherford, 2000]. Malnutrition is an imbalance – a deficiency or an excess – in person's intake of nutrients and other dietary elements needed for healthy living. Malnutrition can manifest itself as hunger (or undernutrition), deficiency in vitamins or minerals or overfeeding. The World Health Organization (WHO) estimates that fully half of the human family, some 3 billion people, suffer from malnutrition of one kind or another. One out of five people in the developing world suffers from the worst the vitamins of malnutrition - hunger [Gardner, 2000]. Malnutrition continues to be a major public health problem throughout the developing world, particularly in southern Asia and sub – Saharan Afraca [Schofield, C and Ashworth, 1996, FAOUN, 2004]. Diets in populations there are frequently deficient in macronutrients (protein, carbohydrates and fat, leading to protein – energy malnutrition), micronutrients (electrolytes, minerals and vitamins, leading to specific micronutrient deficiencies) or both [Brabin and Coulter, 2003, Pinstrup – Andersen et al, 1993, Millward and Jackson, 2004]. The high prevalence of bacterial and parasitic diseases in developing countries contributes greatly to

malnutrition there [Brabin and Coulter, 2003, FAOUN, 2004, De Onis, et al 1993, Stoltzfus, et al 2004]. Similarly, malnutrition increases one's susceptibility to severity of infections and is thus a major component of illness and death form diseases [Brabin and Coulter, 2003, FAOUN, 2004, Murray and Lopez, 1997, and Black, 2003]. Malnutrition is consequently the most important risk factor for the burden of diseases in developing countries [Murray and Lopez, 1997, and Nemer et al 2001]. It is the direct cause of about 300000 deaths per year and is indirectly responsible for about half of all deaths in young children [FAOUN, 2004, Nemer et al 2001]. The functional consequences of malnutrition include not only physical changes e.g. Skeletal and respiratory muscle weakness, impaired immunity and thermoregulation and delayed recovery from illness [Stratton, et. al. 2003]. Poverty is the main underlying cause of malnutrition and its determinants [Duncan, 2001 and Sachs and McArthur, 2005].

MATERIAL AND METHODS

The present study was conducted on malnutrition patients and few healthy subjects as control. In this study, a survey was carried out for malnutrition, from rural and urban populations of Meerut District for three years from 2006 to 2009. For this study, an interview technique was performed to collect the information of subjects regarding their age, sex and family background. For the present study, a total of 128, samples of stool for both rural and urban populations were collected for microscopic investigations in laboratory. The Simple Smear in Saline method [Who 1991] was used to determine the stool samples and the blood samples were also collected for biochemical and hematological examination from urban and rural population of Meerut District. During the Demographic study of persons, the age group, sex, socio-economic and literacy status were included in this study. The mean levels of biochemical and hematological parameters were compared with respective levels of controls. These parameters were also estimated in uncomplicated recovered, complicated recovered and their diagnostic, prognostic importance. Student's 't' test for unpaired samples was used to analyze the data for statistical significance performed to the test for an association between all possible pairs of malnutrition and between the genders of each age group. The values express as mean \pm SE (n = 5) and Hb, RBC, PCV, MCV DLC (Lymphocytes and Eosinophil) values were significantly different from control.

RESULTS AND DISCUSSION

Overall 128, stool samples were examined by Simple Smear in Saline method and the blood samples were also collected for biochemical and hematological examination from the urban and rural population of Meerut District. The age and sex combination shows that out of 40 persons 03 (7.5%) were observed as non - malnourished patients, While 37 (92.5%) were observed as malnourished patients in urban population, in which maximum 15 (40.5%) were marasmaric, 10 (27.0%) undernourished, 07 (18.9%) kwashiorkor marasmaric and 05 (13.5%) were with kwashiorkor. In rural area out of 88 persons 06 (6.8%) were observed as non - malnourished patients, while 82 (93.2%) were observed as malnourished patients, in which maximum 34 (41.5%) were marasmaric, 23 (28.0%) undernourished, 14 (17.0%) kwashiorkor marasmaric and 11 (13.4%) were with kwashiorkor. The age composition of malnourished patients showed that out of 37 malnourished patients in urban population maximum 25 (67.6%) were below 15 years of the age group, 08 (21.6%) were between 15 -25 years of the age group, and 03 (8.1%) were observed between 25 - 35 years of the age group, whereas 01 (2.7%) was observed more than 35 years of the age group. In Rural population out of 82 malnourished patients, maximum 58 (70.7%) were below 15 years of the age group, 17 (21.0%) were between 15 - 25 years of the age group, and 06 (7.3%) were observed between 25 - 35 years of the age group, whereas 01 (1.2%) was observed more than 35 years of the age group. Further, sex wise distribution shows that 56.8% malnourished patients were male and 43.2% females in urban population while in rural population 57.3% were females and 42.7% males. Hematological test Heamoglobin (Hb), Red Blood Cells (RBC), Total Leucocyte Count (TLC), Erythrocyte Sedimentation Rate (ESR), Packed Cell Volume (PCV), Mean Corpuscular Volume (MCV), Mean Corpuscular Heamoglobin (MCH), Mean Corpuscular Heamoglobin Concentration (MCHC) and Different Leukocyte Count (DLC) were observed in control and study groups for the confirmation of malnourished patients. The values express as mean \pm SE (n = 5) and Hb, RBC, PCV, MCV DLC (Lymphocytes and Eosinophil) values were significantly different from control. The results of present study shows that the consonance with socio-economic indicators [lichukwu, et. al. 2010 and Lee, et. al. 2000].

 Table 1: Malnutrition status of persons in urban and rural population.

Casas		Urban	Rural				
Cases	Persons	Prevalence (%)	Persons	Prevalence (%)			
Malnourished	37	92.5	82	93.2			
Non Malnourished	03	7.5	06	6.8			
Total	40	100	88	100			

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Types of Cases		Urban	Rural				
Types of Cases	Persons	Prevalence (%)	Persons	Prevalence (%)			
Undernutrion	10	27.0	23	28.0			
Kwashiorkor	05	13.5	11	13.4			
Kwashiorkor Marasmus	07	18.9	14	17.0			
Marsmus	15	40.5	34	41.5			
Total	37	100	82	100			

Table 2: Types of malnut	trition of patients in urb	ban and rural population.
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Table 3: Malnourished patients in urban and rural according to their age.

	1	Urban	Rural					
Age Group	Malnou F	rished Positive Patients	Malnourished Positive Patients					
	Patients	Prevalence (%)	Patients	Prevalence (%)				
0-15	25	67.6	58	70.7				
15 - 25	08	21.6	17	21.0				
25 - 35	03	8.1	06	7.3				
35 above	01	2.7	01	1.2				
Total	37	100	82	100				

Table 4: Malnourished patients in urban and rural according to their sex.

Condon		Urban	Rural				
Genuer	Persons	Prevalence (%)	Persons	Prevalence (%)			
Male	21	56.8	35	42.7			
Female	16	43.2	47	57.3			
Total	37	100	82	100			

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Parameter	(Unit)	Control	Malnourished Patients				
Hb (gm/dl)		14.42 ± 0.185	$10.4 \pm 0.067 *$				
RBC (Millie	on/cumm)	4.78 ± 0.058	$3.5 \pm 0.031*$				
TLC (/mm ³))	8570 ± 48.29	8560 ± 45.73				
ESR (mm in	n 1 st hr)	3.2 ± 0.375	04 ± 0.0709				
PCV (%)		42.8 ± 0.58	$30.6 \pm 0.245*$				
MCV (cubic	c micron)	89.4 ± 0.134	$87.4 \pm 0.619 *$				
MCH (picog	grams)	30.2 ± 0.0776	30 ± 0.213				
MCHC (%)		33.7 ± 0.086	33.8 ± 0.178				
	P (%)	61 ± 1.0	$55 \pm 1.58*$				
	L (%)	33.2 ± 1.34	33 ± 1.34				
DLC (%)	E (%)	2.6 ± 0.40	$8.4\pm0.70^*$				
	M (%)	03 ± 0.44	2.8 ± 0.375				
	B (%)	0.2 ± 0.20	0.4 ± 0.24				

Values express as mean \pm SE (n = 5)

*Value significantly different from control



Fig. 1: Graph showing the malnutrition status in urban and rural population.



Fig. 2: Graph showing the types of malnutrition in urban and rural population.



Fig. 3: Graph showing the status of malnourished patients in urban and rural population according to their age.



Fig. 4: Graph showing the status of malnourished patients in urban and rural according to their sex.

CONCLUSION

The present study is fulfilling the national needs and human health hazards which are the most urgent and serious problem to be tackled at the present day conditions. This study provides the influence of unhygienic condition and malnutrition. The population belonging to undeveloped countries and weaker section suffering from malnutrition are weakened physically and mentally. These population also become susceptible to various infectious diseases and sometimes if untreated they die.

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