



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2579192>Available online at: <http://www.iajps.com>

Research Article

**RENAL ANATOMICAL AND PHYSIOLOGICAL
DISTURBANCES IN CHILDREN WITH MALNUTRITION**¹Dr. Farzana Shaikh, ¹Dr. Ghulam Shabir Laghari, ²Dr. Samar Raza³Dr. Hamid Nawaz Ali Memon, ⁴Dr Almas Jahejo and ²Dr. Ali Raza Shaikh¹ Department of Pediatrics, Liaquat University of Medical and Health Sciences (LUMHS)
Jamshoro²Liaquat University Hospital Hyderabad / Jamshoro³Zulekha Hospital Dubai United Arab Emirates⁴Liaquat University of Medical and Health Sciences (LUMHS) Jamshoro**Abstract:****OBJECTIVE:** To determine the renal anatomical and physiological disturbances in children with malnutrition**PATIENTS AND METHODS:** The six months cross sectional study was conducted on the term malnourished children of either gender. All the children had detail clinical history from parents/ next to kin and physically examined (anthropometric measurements and systemic examination) while the appropriate and relevant investigations were advised accordingly whereas the kidney sizes were determined by ultrasonography. The urine sample was sent for culture and sensitivity while the frequency / percentages (%) and means \pm SD computed for study variables.**RESULTS:** During six month study period total fifty malnourished children were explored thoroughly. the frequency for male and female population was 30 (60%) and 20 (40%) with mean \pm SD for age of male and female individuals was 30.62 \pm 8.94 (months) and 35.73 \pm 7.63 respectively. gender male 30 (60%), female 20 (40%), residence urban 15 (30%), rural 35 (70%), kidney size normal 18 (36%) and decrease 32 (64%), urinary tract infection was observed in 28 (56%).**CONCLUSION:** Malnutrition definitely affects the kidney size as 46% of the malnourished children had reduced kidney sizes.**KEYWORDS:** Renal, Malnutrition and Kidney.**Corresponding author:***** Dr. Samar Raza,**

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Please cite this article in press Samar Raza et al., *Renal Anatomical and Physiological Disturbances in Children with Malnutrition*, Indo Am. J. P. Sci, 2019; 06(02).

INTRODUCTION:

Malnutrition is one of the most common health problems involves hundreds of millions of children in the world [1]. It is estimated that the incidence of malnutrition in children is very high in developing countries [2]. Kidneys are a pair of important organs in humans that serves the excretory and to some extent synthetic function which are important in maintenance of the normal homeostasis/ milieu [3]. Although the formation of nephrons is complete by 35 to 36 weeks of gestation/intrauterine life, the glomerular and tubular growth continue in the post natal life especially in the first eighteen months of life [4]. Although it is often stated that renal growth parallels somatic growth this is overly simplistic and at present unsubstantiated [5]. The factors influencing and modifying normal renal growth and development remains poorly understood. One of the most important factors identified in the growth of the kidneys is the nutrition of the child. Malnutrition in addition to its effect on renal growth is also known to affect the functioning of the kidney and the glomerular filtration rate and renal plasma flow is reduced in these children [6]. Malnutrition and infection is a vicious cycle and the incidence of UTI in malnourished children is quite high while the urinary tract infection is the one which may not present with overt clinical symptoms in a child who is malnourished and it is of utmost importance to identify such children who have UTI and treat them accordingly to prevent the sequelae of an untreated UTI [7]. There had been limited literature which has evaluated the effect of malnutrition on the kidney size its function and the occurrence of UTI in malnourished children.

The present study was aimed to explore the kidney size and occurrence of UTI in malnourished children at tertiary care hospital.

PATIENTS AND METHODS:

The six months cross sectional study was conducted on the term malnourished children of either gender while the exclusion criteria were children who were born either premature or postmature and/or were small for gestational age or large for gestational age, children having congenital anomalies of the kidney and urinary tract and anatomical abnormalities that could influence the renal size. All the children had detail clinical history from parents/ next to kin and physically examined (anthropometric measurements and systemic examination) while the appropriate and relevant investigations were advised accordingly whereas the kidney sizes were determined by ultrasonography. The urine sample was sent for culture and sensitivity and was considered to be infective when there was more than 5 pus cells/hpf in a centrifuged sample of urine or positive urine culture. All the data was collected on predesigned proforma while analyzed in SPSS to explore the frequencies, percentages and mean \pm SD.

RESULTS:

During six month study period total fifty malnourished children were explored thoroughly. The frequency for male and female population was 30 (60%) and 20 (40%) with mean \pm SD for age of male and female individuals was 30.62 ± 8.94 (months) and 35.73 ± 7.63 (months) respectively. The demographical and clinical profile of study population is presented in Table 1.

TABLE 1: THE DEMOGRAPHICAL AND CLINICAL PROFILE OF STUDY POPULATION

Age (months)	Frequency (n=50)	Percentages (%)
06-10	07	14
11-20	09	18
21-29	08	16
30-29	10	20
40-49	09	18
50-59	07	14
GENDER		
Male	30	60
Female	20	40
RESIDENCE		
Urban	15	30
Rural	35	70
KIDNEY SIZE		
Normal	18	36
Decrease	32	64
URINARY TRACT INFECTION		
Yes	28	56
No	22	44

DISCUSSION:

Malnutrition in children is one of the most common problems in developing country like Pakistan as already stated effects of malnutrition on the body are protean involving almost all the organ systems in the body. Protein deprivation in the early years of life especially during latter half of infancy and second year of life is known to affect the growth and functioning of the kidney [8]. Earlier only intravenous pyelogram was used to determine the renal size however with the advent of ultrasonography imaging of the kidney has become more easy and more importantly its non invasive with no risk of radiation exposure [9]. Malnourished children are susceptible to infection in particular urinary tract infection which is often the most common cause which hinders a child's growth. The present study was undertaken to know the effect of malnutrition on kidney size and also the incidence of UTI in such children [10]. In the present study majority of the enrolled patients were males (60%) and similarly study conducted by Aydin E, et al [11] had enrolled 74 malnourished children of which majority of them were males (56.75%) and the mean age in months studied was 29.6 ± 14.0 .

In the present study the left and right kidney length, width, depth and parenchymal width of malnourished children was significantly lower. This can be explained by the effect of malnutrition on kidney

growth. The primary cause for this is the decreased protein intake which hampers the normal growth and development of the renal tubular cells particularly of the proximal tubules [12]. It has been established that though the nephron formation is complete by birth, the glomeruli and renal tubular cells continue to grow in the post natal period and if there is inadequate dietary intake particularly protein it decreases the cell size and contributes to the overall decrease in size of the kidneys. Similarly the study conducted by Aydin E, et al [11]. showed that both left and right kidney length, parenchymal width of malnourished children were significantly lower than those of healthy controls. Banapurmath et al. had undertaken a study enrolling 88 malnourished children had UTI constituting 8% of the study population.

CONCLUSION:

Malnutrition definitely affects the kidney size as 46% of the malnourished children had reduced kidney sizes. Thus all malnourished should have their kidney sizes recorded which must be closely monitored during their subsequent follow up while all malnourished children to be screened for UTI irrespective of the presence of symptoms.

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