



MALNUTRITION; MALNUTRITION AMONG HOSPITALIZED CHILDREN IN TERTIARY CARE HOSPITAL.

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ABSTRACT... Objectives: To measure the frequency of malnutrition among hospitalized children with Nutritional Risk Score (NRS) >4 at presentation. The malnutrition in children often deteriorates due to stay in hospital. In order to prevent acute hospital-acquired malnutrition and its complications, the risk of nutritional depletion status needs to be identified at the time of admission so that appropriate nutritional intervention can be initiated at an early stage. **Study Design:** Descriptive case series study. **Setting:** This research project was carried-out in surgical ward of Paediatric unit, Pakistan Institute of Medical Sciences (PIMS), Islamabad. **Period:** One year from January 2016 to December 2017. **Subjects & Methods:** A total of 100 cases with NRS>4 were selected, who got admitted to the surgical ward for 24 hours pre-surgery. The permission from the ethical committee of PIMS was sought before the commencement of the project. Informed consent was obtained from parents/guardians. The interview was taken from the person, who had been with the patient most of the time during the last 24 hours (mother or the care-taker). The height, weight was measured and BMI calculated. A complete assessment of NRS was performed and following risk factors were evaluated i.e. food intake, pathological stress factors and difficulty retaining food. These risk factors were classified as mild, moderate and severe. All the data was collected on a proforma prepared for the said purpose. **Results:** The patients between 1-6 years of age were 53% (n=53); while 47% (n=47) were between 7-14 years of age. The mean age was 6.58+3.63 years out of which 54% (n=54) were male and 46% (n=46) females. The frequency of malnutrition was recorded in 65% amongst the hospitalized children with NRS>4 at presentation. **Conclusion:** The frequency of malnutrition is quite high, amongst hospitalized children with NRS>4 at presentation. The cause of this malnutrition /under-nutrition needs to be addressed, and guidelines may be adapted to control and minimize hospital related malnutrition.

Key words: Hospitalized Children, Nutritional Risk Score, Pre-surgery, Malnutrition, Under Nutrition, Stunted Growth.

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INTRODUCTION

The malnutrition is defined by World Health Organizations (WHO) as cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions.¹ One of the commonest probable cause of worsening of health in hospitalized children is under-nutrition. In hospitalized children, the under nutrition prevails in almost 15% of children in developed countries and 50% in developing countries.^{2,3} Not only in developing countries but in the developed world the child malnutrition is quite higher. Malnutrition is linked with numerous adverse effects including

depression of the immunity, impaired wound healing, muscle wasting, extended stay in hospital, increased costs of treatment and increased rate of morbidity and mortality.^{4,5} Nutritional anemia is one of the common cause of stunted growth and malnutrition.^{6,7} This is because of anorexia, nil by mouth for medical reasons, catabolic stress of the disease or surgery and side effects of the drugs and medical procedures.^{7,8} Early Onset Neonatal Sepsis is due to impaired organ function, immature immune system in nutritionally depleted patients, which further lead to impaired immune and muscle function. All this leads to increase in infectious complications,

delayed recovery, impaired cardiopulmonary functions, delayed mobilizations and longer periods of hospitalizations.^{9,10} Thus a vicious circle of ill health and hospitalization is set in. Furthermore, the surgical patients are kept nil by mouth for a variable period before and after surgery which has detrimental effects on the already malnourished children and it further impairs healing and increases the susceptibility to infectious complications.¹¹

In clinical set-up, there is difficulty in evaluation of nutritional status because there is no sole gauge which can be used to detect malnutrition in isolation. The extent of patient's current nutritional status cannot predict that whether it is hospital acquired malnutrition or the patient was already malnourished. In order to avert worsening in the nutritional status of well-nourished or currently moderately fed patients; an assessment tool to scale the nutritional risk is required.¹² Identification of malnutrition in high risk children could aid the introduction of early and timely nutritional support and prevent the long-term impact of malnutrition on growth and development. There are a few simple nutritional screening tools available in the literature. NRS developed by Reilly et al help in incorporating percent body weight for total percent of the ideal body weight for height in children, stress factors (effect of medical condition on nutritional requirements) and food intake.¹³

This scoring system was based on questionnaire and weight for height was measured. No laboratory investigations were required. This scoring system; imitates the risk of under-nutrition and provide guidance for relevant action. So, it can be used at community level because the procedure is safe, non-invasive and free of cost. Moreover, the procedure can be completed at bed-site.^{11,14} This data will help in organizing the meager resources of hospitals in developing countries to provide better services to the needy.

OBJECTIVES

To measure the frequency of malnutrition among hospitalized children with NRS > 4 at presentation.

MATERIAL & METHODS

It was descriptive case series study, initiated after the approval of research project from ethical review committee of PIMS. The sampling was done in surgical ward of Children Hospital PIMS, Islamabad. It was non-randomized convenience sampling. The study was completed in a period of one year, extending from January 2016 to Dec. 2017.

The sample size for this study was projected by using the WHO calculator. Confidence level 95%, anticipated population proportion 84%,⁹ absolute precision required 8%, minimal sample size (n)=95. The children of both the genders between ages of 1 year to 14 years were included in the study with NRS more than or equal to 4. The patients suffering from hepatic, renal or cardiac disease were excluded from the study. Those admitted to intensive care unit or suffering from malignancy were also excluded from the study.

The permission from the hospital ethical committee was pursued before starting the study. Informed consent was acquired from parents/guardians for inclusion of child in the study. The admission list of the last 24 hours was taken from the hospital administration every morning. The attendant who had been with the patient most of time in previous 24 hours (mother or the care taker) was interviewed. The height, weight and BMI were measured. A complete assessment of NSR was performed and following risk features were evaluated: food intake, difficulty retaining food, pathological stress factors and they further were categorized as mild, moderate and severe. Three classes of risk was identified as at low, moderate and high risk of malnutrition and linked to special action, and followed for one week after the surgery. All the data was collected on the especially designed proforma drafted by the researcher. The height, weight and BMI was measured and compared with the US Centre for Disease Control (CDC) 2000 reference population.

Questions were asked from the care takers according to the nutritional risk score designed by Reilly, mentioned in the proforma.⁸

DATA ANALYSIS

SPSS version 20 was employed and data was analyzed. For quantitative variables such as age, height, weight, BMI and nutritional risk scoring, mean+SD was calculated. Frequencies and percentages were measured for study variables such as gender and malnutrition. Effect modifiers like age and gender were controlled by stratification. Chi square test was applied. P value <0.05 was considered significant.

RESULTS

Total 100 cases fulfilling the inclusion/exclusion criteria were enrolled to measure the frequency of malnutrition among hospitalized children with NRS > 4 at presentation. It was seen that 53% (n=53) of patients were between 1-6 years of age while 47%(n=47) were between 7-14 years of age. The mean age of the subjects was calculated as 6.58+3.63 years. (Table-I). Mean weight was calculated as 22.49+9.20 kg, height was calculated as 126.28+18.43 cm and BMI was calculated as 19.52+3.08. (Table-II)

Frequency of malnutrition among hospitalized children with NRS>4 at presentation was recorded in 64% (n=64) while 36% (n=36) had no findings of malnutrition. Stratification for age shows that out of 65 cases of malnutrition, 41 were between 1-6 years and 24 were between 7-14 years of age, p value was calculated as 0.0001. Stratification for gender shows that out of 65 cases of malnutrition, 37 were male and 28 were female, p-value was 0.42. It gives an impression that male are more prone to malnutrition than female.

Malnutrition Frequency in children with NRS>4

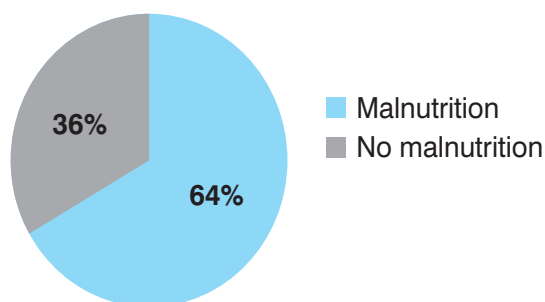


Figure-1. Malnutrition frequency in children presented.

Age (in Years)	No. of Patients	%
1-6	53	53
7-14	47	47
Total	100	100
Mean+SD (age)	6.58+3.63	

Table-I. Age distribution (n=100)

Variable	Mean	SD
Height (cm)	126.28	18.43
Weight (kg)	22.49	9.20
BMI	19.52	3.08

Table-II. Mean height, weight and BMI (n=100)

DISCUSSION

The nutritional status of children usually worsens after hospital admission. The exact frequency of under-nutrition in hospitalized children is tremendously difficult to compute. Various studies propose that >50% of children in acute surgical or medical wards are nutritionally compromised.¹⁴ Male are more prone to malnutrition than female. This variation of malnutrition between the two genders is similar to results of our study.¹⁵ The majority of studies on child nutritional status have described prevalence of malnutrition among under-five children and analyzed socioeconomic, demographic and cultural factors associated with child malnutrition.^{2,3,4} The current study was planned in accordance with best of our knowledge, that there is only few data on nutritional status of hospitalized children and nutritional risk screening from developing countries, particularly Pakistan.

It was observed that 91% of children with NRS-4, during a period of 1st week of hospitalization stay; lost more than 2% of their reference weight while 84% of children with NRS-5 lost more than 2% of reference weight.¹⁶ Our results were in concordance with other studies conducted world wide.¹⁰ There is huge amount of malnutrition in hospitalized children and this malnutrition worsens further during hospital stay if appropriate measures are not opted.¹⁷

Different factors like like inflation, lack of resources, affordability, reduced production of food in country due to various reasons have lead to malnutrition. The conflicts within the country and tensions on borders have increased food prices, matched with the limited ability of

productive areas to feed population centers, due to logistic constraints, which have generated malnutrition rates of up to 20 percent in certain health zones.^{18,19}

The results of this study were not encouraging in our population because there was a huge no. of children suffering from malnutrition. However, some-other trials are required to validate our findings, as this was the first study of its kind which provided the data and may be helpful in paying particular attention to children who need urgent nutritional support before their further deterioration. This data is helpful in organizing the meager resources of hospitals in developing countries to offer services to the needy, and the use of NRS at admission may identify children requiring focused nutritional assessment.¹²

CONCLUSION

Its concluded that the frequency of malnutrition is higher, amongst hospitalized children with NRS>4 at presentation. This tool (NRS) is useful to record nutritional status in admitted children.

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



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The power of **imagination** makes us **infinite**.

”

“John Muir”

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Irum Javed	Concept design, data collection, Critical review.	
2	M. Sajid Mehmood	Concept design, data analysis, write up.	
3	Jawad Khalid	Concept design, data collection, critical review.	
4	Sajid Shamim	Concept design, critical review.	
5	Shahid Iqbal	Concept design, critical review proof reading.	
6	Rashad Shamsi	Concept design, critical review.	