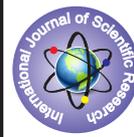


TO COMPARE AND ASSESS THE FREQUENCY OF ORGANISMS INVOLVED IN CAUSALITY OF DISEASES AND MORTALITY IN CHILDREN WITH SAM.



Paediatrics

KEYWORDS: Severe acute malnutrition, Sepsis, causative organisms

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ABSTRACT

Severe acute malnutrition (SAM) defined by a very low weight for height (below -3z scores of the median WHO growth standards), is a devastating public health problem of epidemic proportions. Diminished immune functions render undernourished patients more susceptible to multiple infections and many severely malnourished children die from delay in appropriate treatment. In this context this study was undertaken in department of pediatrics in a tertiary care hospital to compare and assess commonly involved organisms causing infection in patients with severe acute malnutrition to assess local epidemiology.

MATERIAL AND METHODS: In this study 72 children aged 6 months-60 months, classified as SAM children as per WHO criteria were included and blood and blood culture were studied.

RESULTS AND CONCLUSION : Our study shows that infections in patients with severe acute malnutrition is a common occurrence with gram negative organisms being more than gram positive organisms. Also that children less than 2 years of age are more prone to develop severe acute malnutrition than older ones with females more commonly affected than males.

INTRODUCTION : Severe acute malnutrition (SAM) defined by a very low weight for height (below -3z scores of the median WHO growth standards), is a devastating public health problem of epidemic proportions. It is one of the leading causes of morbidity and mortality in childhood. Children with severe malnutrition are at risk of several life threatening problems like hypoglycemia, hypothermia, serious infections and severe electrolyte imbalance. (1),(2),(3).

Diminished immune functions render undernourished patients more susceptible to multiple infections and many severely malnourished children die from delay in appropriate treatment.(4),(5),(6),(7) Thus, knowing the commonly implicated organisms will be helpful in formulating an effective empirical regimen.

In this context this study was undertaken in department of pediatrics in a tertiary care hospital to compare and assess commonly involved organisms causing infection in patients with severe acute malnutrition to assess local epidemiology.

OBJECTIVE:

To compare and assess the frequency of organisms involved in causality of diseases and mortality in children with SAM.

MATERIAL AND METHODS:

In this study 72 children aged 6 months-60 months, classified as SAM children as per WHO criteria described before (in introduction), were admitted in pediatrics ward with obvious signs of infections such as hyperthermia, diarrhea, respiratory illness, urinary tract infections or with non obvious signs of infections such as hypothermia, poor oral acceptance, hypoglycemia are included in the study. Children aged below 6 months and above 60 months and whose parent/patient not giving consent were excluded.

Blood samples were collected on admission prior to administration of antibiotics as per the blood culture guidelines for phlebotomist collection of specimen for culture sensitivity. Quantity of blood-1 ml/year of child, in culture broth 10 times the quantity of blood. Site of collection is preferably peripheral vein ,an area of 5 cm sterilized with 70% alcohol for 30 seconds in encircling pattern from centre to periphery then widening with 10% betadine for 60 seconds).

Results of culture sensitivity collected.

The information regarding of culture sensitivity reports arranged as systematic data.

OBSERVATIONS AND RESULTS:

TABLE 1 Age wise distribution

AGE	No of cases	Percent
< 1 yr	36	50.0
1-2 yr	31	43.1
>2 yr	5	6.9
Total	72	100.0

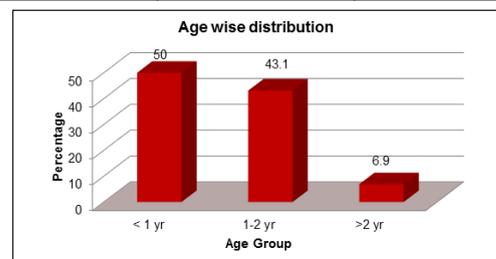


TABLE 2 Sex wise distribution

Sex	No Of Cases	Percent
Female	41	56.9
Male	31	43.1
Total	72	100.0

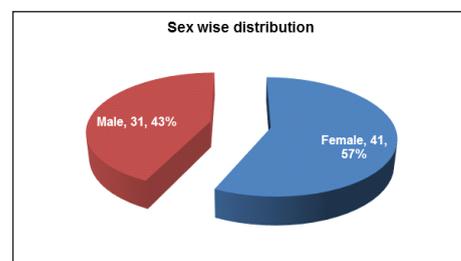


TABLE - 3 Culture positive Organisms Gram staining

Result	Gram Stain	
	Gram Positive	Gram Negative
Result	26.67%	73.34%

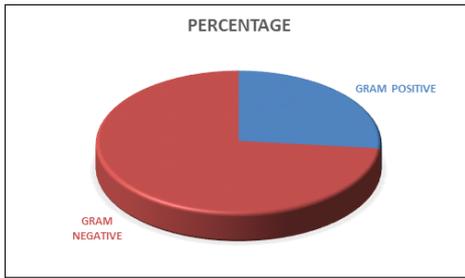


TABLE - 4 Blood culture results

Blood Culture	No of cases	Percent
Positive	30	41.7
Sterile	42	58.3
Total	72	100.0

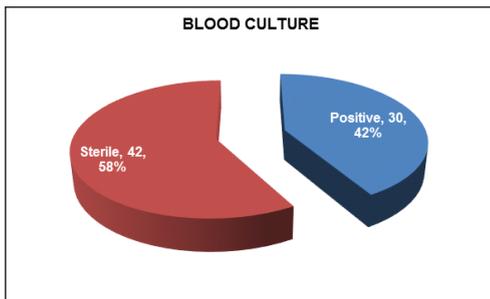
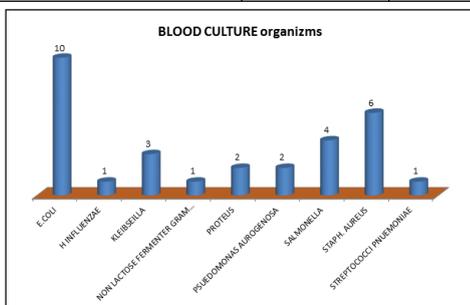


TABLE - 5 Blood culture organisms

Blood Culture Organisms	No of cases	Percent
E.Coli	10	33.34
H Influenzae	1	3.34
Kleibseilla	3	10.0
Non Lactose Fermenter Gram Negative Bacilli R	1	3.34
Proteus	2	6.67
Psuedomonas Aurogenosa	2	6.67
Salmonella	4	13.34
Staph. Aureus	6	20.0
Streptococci Pnuemoniae	1	3.34
Total	30	100.0



Our study included a total number of 72 cases of severe acute malnutrition with suspected sepsis were admitted and their blood cultures were studied with following results :

- 1) Children <1 yr constituted 50% (36/72) of cases, whereas children aged between 1-2 yr constituted 43.1% (31/72) and >2 yr 6.9% (5/72) respectively.
- 2) The cases as per gender are females 56.9% (41/72) and males 43.1% (31/72) respectively.
- 3) Of the blood culture results in our study, 41.7% (30/72) were culture positive and 58.3% (42/72) were found sterile respectively.

4) Gram negative organisms (73.34%) were more common cause of bacteraemia than gram positive ones (26.67%).

5) In positive blood culture results the organisms in decreasing order of frequency are E.Coli 33.34% (10/30), Staph. aureus 20% (6/30), Salmonella 13.24% (4/30), Kleibseilla 10.0% (3/30), Proteus and Psuedomonas aurogenosa 6.67% each. (2/30) and Streptococcus pnuemoniae, H.influenzae, and non-lactose fermenting gram negative bacteriae 3.34% (1/30) each respectively.

DISCUSSION:

In our study, the maximum number of patients admitted were 50%(36/72) of <1yr, 43.1% (31/72) between 1-2 year and 6.9% (5/72) >2 year. So the maximum number of patients who were admitted in our set up belonged to < 2 year of age which is nearly 93%. This is in accordance with study done by Mahama Sakaa et al⁽⁸⁾ in which the number of patients under two years of age was 63.2% of which 26.4% (92/348) were between 6 -11 months and 36.8% (128/348) patients were between 12-23 months of age.

Regarding sex distribution our study had female prelidiction for admission as 56.9% (41/72) were females and 43.1% (31/72) were males. It is in accordance to national trends of our country having the under five mortality rate higher for females than males. As per SRS 2010, U5MR stood at 64 for females whereas it is 55 for males^{(3),(9)}.

In our study blood culture was positive in 42% (30/72) of patients, while culture of 58% (42/72) of patients remained sterile, as compared to studies conducted by Babirekre-Iroso et al⁽¹⁰⁾ who observed the prevalence of bacteraemia to be 22% in their study and Noorani et al⁽¹¹⁾ found 28.9% of their patients to be bacteraemic.

Among the organisms causing bacteraemia, gram negative organisms (73.34%) were found to be a more common cause of bacteraemia than gram positive ones (26.67%). This is in conjunction with studies conducted by Noorani et al⁽¹¹⁾, Babirekere-Isors et al⁽¹⁰⁾ found predominance of gram negative organisms (77%) in causing septicemia. Bachou et al⁽¹²⁾ too found predominance of gram negative organisms (58%) in causing bacteraemia. Others with predominance of gram negative organisms in their studies were Shimles et al⁽¹³⁾ with 36%, Berkowitz et al⁽¹⁴⁾ with 19%, and Noorani et al⁽¹¹⁾. Whereas gram positive dominance as a cause of sepsis were found in studies of Issac et al⁽¹⁵⁾. Phillip C. Hill et al⁽¹⁶⁾ estimated 73% organisms as gram positive in causing sepsis.

Our study had E.coli as the predominant organism among bacteraemic patients accounting for 33.34% of culture positive patients, followed by Staph aureus in 20% of culture positive patients, Salmonella in 13.34%, Kleibseilla in 10%, Proteus and Psuedomonas in 6.67% each and lastly H.influenzae, Strepto-coccus pnuemoniae and non lactose fermenting gram negative bacilli 3.34% each. Comparing our results to other studies as BabirekereIroso et al⁽¹⁰⁾ had 67% of organisms as E.Coli and Salmonella, Bachou et al⁽¹²⁾ found 39.4% Salmonella, 26.3% Staph aureus and 13.2% Streptococcus pneumonia, whereas Issac⁽¹⁵⁾ found Staph aureus, as most common organism in his study.

CONCLUSION:

Our study shows that infections in patients with severe acute malnutrition is a common occurrence with gram negative organisms being more than gram positive organisms. Also that children less than 2 years of age are more prone to develop severe acute malnutrition than older ones with females more commonly affected than males.

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