ORIGINAL RESEARCH PAPER

Paediatrics

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TOPIC : TO STUDY AND COMPARE THE EFFECTS OF DEMOGRAPHIC PROFILE AND ANTHROPOMETRIC PARAMETERS ON INCIDENCE AND OUTCOME OF INFECTIONS IN PATIENTS WITH SEVERE ACUTE MALNUTRITION.

KEYWORDS

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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. Studies have revealed case fatality to be high in children with bacteremia compared to those without. Diminished immune functions render undernourished patients more susceptible to infections, notably by opportunistic pathogens.*

We undertook this study to compare and assess the effects of demographic profile and anthropometric parameters on incidence and outcome of infections in patients with severe acute malnutrition.

Material and methods : *In this study 72 children aged 6 months-60 months, classified as SAM children as per WHO criteria with suspected infection were included. Age(determined on the basis of history given by any of the parent and/or birth certificate if hospital delivery), sex, weight for height, height for age were noted. Their blood cultures were performed and results were analysed.*

Results and conclusion : *Our study showed that children less year are more commonly affected and females are more commonly affected than males. Also that more severely wasted and stunted children are more commonly affected. And that gram negative organisms are more commonly implicated than gram positive organisms in our setting.*

INTRODUCTION :

Severe acute malnutrition (SAM) is a devastating public health problem of epidemic proportions. It is one of the leading causes of morbidity and mortality in childhood. Every year, 5 million children die of malnutrition. Children with severe malnutrition are at risk of several life threatening problems like hypoglycemia, hypothermia, serious infections and severe electrolyte imbalance. Because of this vulnerability, they need careful assessment, special treatment and management[1,2,3]

Definition: The assessment of nutritional status as per WHO guidelines is done according to:

1. Weight for Height (length)
2. Height (or length) for Age, and
3. Presence of Edema.

As per the WHO Classification, SAM is defined as a score of less than -3 SDS (standard deviation score) where SDS is defined as the deviation of the value for an individual from the median value of reference population divided by standard deviation of standard reference population.

Studies have revealed case fatality to be high in children with bacteremia compared to those without. Diminished immune functions render undernourished patients more susceptible to infections, notably by opportunistic pathogens[4,5,6,7].

We undertook this study to compare and assess the effects of demographic profile and anthropometric parameters on incidence and outcome of infections in patients with severe acute malnutrition.

MATERIAL AND METHODS :

In this study 72 children aged 6 months-60 months, classified as SAM children as per WHO criteria 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.

Age(determined on the basis of history given by any of the parent and/or birth certificate if hospital delivery), sex, weight for height, height for age were noted.

- As per the blood culture guidelines for phlebotomist collection of specimen for culture sensitivity before giving antibiotics.
- Results of culture sensitivity collected and analysed.

OBSERVATIONS AND RESULTS :

OBSERVATIONS

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

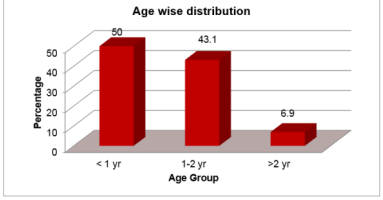

TABLE 2
Sex wise distribution

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

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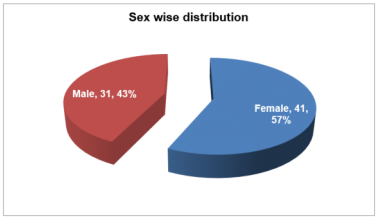

TABLE 3
Outcome of patients

Outcome	No of cases	Percent
Death	3	4.2
Discharge	69	95.8
Total	72	100.0

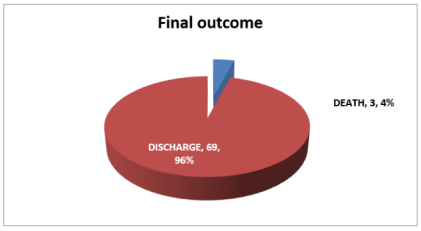

TABLE - 4
Culture positive Organisms Gram staining

	Gram Stain	
	Gram Positive	Gram Negative
Result	26.67%	73.34%

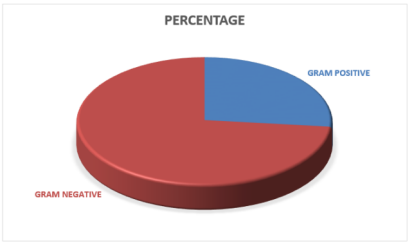

TABLE - 5
Blood culture results

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

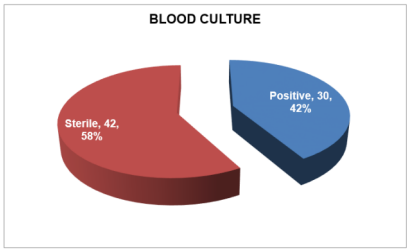

TABLE - 6
Blood culture organisms

Blood Culture Organizms	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

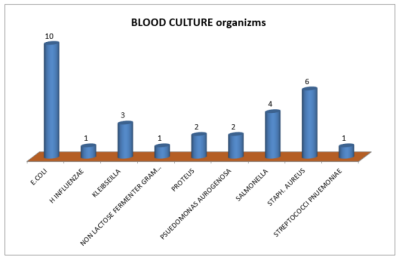

TABLE - 7
Blood Culture Results and Outcome

Blood Culture Organizms	Outcome	
	Death (n = 3)	Discharge (n=69)
E.Coli	0	10
	0.0%	14.5%
H Influenzae	1	0
	33.3%	0.0%
Kleibseilla	0	3
	0.0%	4.3%
Non Lactose Fermenter Gram Negative Bacilli R	0	1
	0.0%	1.4%
Proteus	1	1
	33.3%	1.4%
Psuedomonas Aurogenosa	0	2
	0.0%	2.9%
Salmonella	0	4
	0.0%	5.8%
Staph. Aureus	0	6
	0.0%	8.7%
Sterile	1	41
	33.3%	59.4%
Streptococci Pnuemoniae	0	1
	0.0%	1.4%

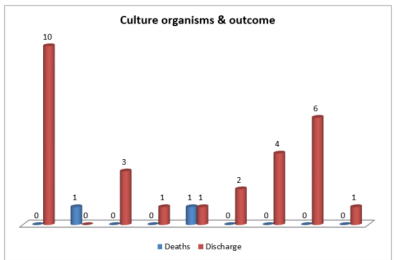

TABLE - 8
Blood culture and outcome

Blood Culture	Death (n=3)	% Death	Discharge (n=69)	% discharge
Positive	2	66.7	28	40.6
Sterile	1	33.3	41	59.4

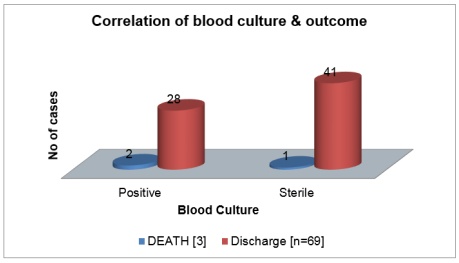

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TABLE - 9
Age of patients and outcome

Age	Death (n=3)	% Death	Discharge (n=69)	% discharge
< 1 yr	1	33.3	35	50.7
1-2 yr	2	66.7	29	42.0
> 2 Yr	0	0.0	5	7.2

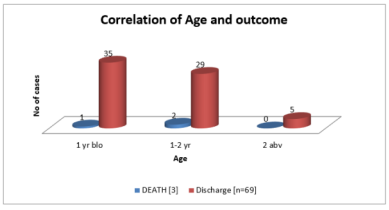


TABLE - 10
Sex and Death

Sex	Death (N=3)	% Death	Discharge (n=69)	% discharge
Female	1	33.3	40	58.0
Male	2	66.7	29	42.0

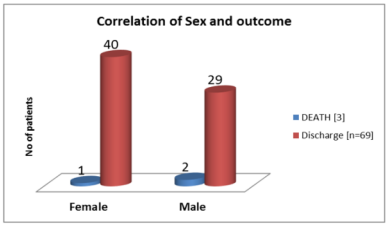


TABLE - 11
Weight For Height and Outcome

Weight For Height	Death (n = 3)	% Death	Discharge (n=69)	% discharge
0	0	0.0	22	31.9
1	3	100.0	47	68.1

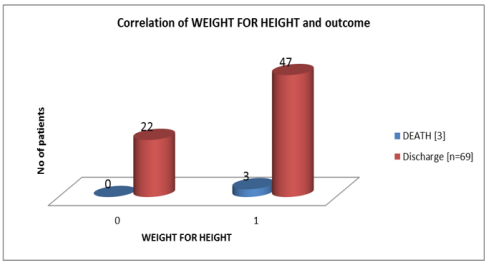


TABLE - 12
Height for age and outcome

Height For Age	Death (n = 3)	% Death	Discharge (n=69)	% discharge
0	0	0.0	32	46.4
1	3	100.0	37	53.6

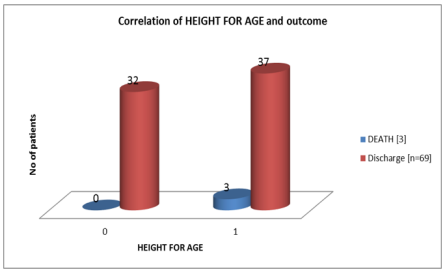
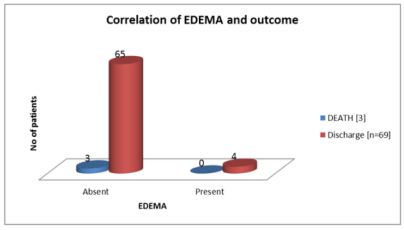


TABLE - 13
Edema and outcome

EDEMA	Death (n = 3)	% Death	Discharge (n=69)	% discharge
0	3	100.0	65	94.2
1	0	0.0	4	5.8



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 bactereamia 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 aerogenosa 6.67% each. (2/30) and Streptococcous pnuemoniae, H.influenzae, and non-lactose fermenting gram negative bacteriae 3.34% (1/30) each respectively.

6) Among total number deaths, 66.7% (2/3) were culture positive and 33.3% (1/3) were sterile. In discharged patients 40.6% (28/69) were culture positive and 59.4% (41/69) had their culture results as sterile(p=>.05)
7) Among total number of deaths, 33.33% (1/3) were in <1yr age group, and 66.67% (2/3) were in age group between 1-2 years of age, 50.7% (35/69) were discharged in <1 year group, 42% (29/69) were discharged from 1-2 year group and 7.2% (5/69) were discharged from >2year age group.(p>.05)

8) Among total number of patients died, 33.33% (1/3) were female and 66.67% (2/3) were male. In discharge group, 58% (40/69) of the patients discharged were female and 42% (29/69) patients were male.(p>.05)

9) Among died all of then 100% (3/3) had their weight for height <3 SD. Of the discharged group 68.1% (47/69) had their weight for height below 3 SD.(p>.05)

10) Among died, all 100% (3/3) had height for age <3 SD, and 53.6% (37/69) of the patients discharged had height for age <3 SD.(p>.05)

11) Of the patients died none had edema and only 5.8% (4/69) of the discharged patients had presence of edema on admission.(p>.05).

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

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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-Iriso et al[10] who observed the prevalence of bacteremia to be 22% in their study and Noorani et al[11] found 28.9% of their patients to be bacteraemic.

Coming the outcome of patients with respect to different parameters, in our study of the total number of deaths, 66.7% (2/3) were culture positive and 33.3% (1/3) were sterile. In discharged patients, 40.6% (28/69) were culture positive and 59.4% (41/69) had their culture results as sterile. Reed et al[12] (1996) found in their study the case fatality rate for bacteraemic children was (22.6%) significantly greater than in those without bacteraemia (9.3%). The mortality rate from gram-negative bacteremia (43.5%) was three times that of gram-positive bloodstream infection (16.7%)[13].

In our study, total no of deaths 33.33%(1/3) were caused in <1yr age group, and 66.67%(2/3) were in age group between 1-2 years of age. In the discharged patients 50.7%(35/69) were discharged in <1 year group, 42%(29/69) were discharged in 1-2 year group and 7.2%(5/69) were discharged >2year age group. Mahama Saaka et al8 found the children aged 24–59 months had 5.[8] times higher probability of recovery from SAM as compared to children aged 6–11 month and younger children were of greater risk of non recovery.

In our study total no of patients died 33.33% (1/3) were female and 66.67% (2/3) were male. In discharge group 58% (40/69) of the patients discharged were female and 42% (29/69) number of patients were male whereas the under five mortality rate is higher for females than males U5MR stood at 64 for females whereas it is 55 for males [3] as per, Sample Registration System 2010.

In our study, among the total no of patients died all of the 100% (3/3) had their weight for height < 3 SD. Of the discharged group 68.1% (47/69) had their weight for height below 3 SD, All died 100% (3/3) had height for age < 3 SD, 53.6% (37/69) of the patients discharged had height for age < 3 SD.

CONCLUSION:

From our study, we conclude that children less year are more commonly affected and females are more commonly affected than males. Also that more severely wasted and stunted children are more commonly affected. And that gram negative organisms are more commonly implicated than gram positive organisms in our setting.

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