

# Outcomes of Severe Acute Malnutrition in Pediatric Population by Using Formula F100 Therapeutic Feed

Saima Rayaz<sup>1</sup>, Mohammad Iqbal<sup>2</sup>, Muhammad Hussain<sup>1</sup> and Attaullah Bizenjo<sup>2</sup>

## ABSTRACT

**Objective:** To examine the prevalence and treatment outcomes of severe acute malnutrition in children.

**Study Design:** Prospective study

**Place and Duration of Study:** This study was conducted at the Department of Pediatric Medicine Unit-3, Civil Sandeman Provincial Hospital Quetta from January 2019 to June 2019.

**Materials and Methods:** A total of 150 patients of both genders presented with severe acute malnutrition were included in this study. Patient's ages were ranging from 2 months to 48 months. Patients demographic including age, sex, malnutrition type and residence were recorded after taking informed consent from patient's parents/guardians. Presentations on admission were recorded. F75 and F100 therapeutic feed were given to all the patients (WHO Guideline for malnutrition). Outcomes were recorded.

**Results:** There were 80 (53.33%) male patients while 70 (46.67%) were females. Sixty eight (45.33%) patients were ages less than 10 months and 82 (54.67%) were ages above 10 months. From all the patients 134 (89.33%) patients were marasmus and 16 (10.67%) patients were khwashikor. Mean weight gain by using F100 was 7.26±3.45 gm/kg/day. 92% patients were recovered and 8% died during treatment. The most common presentation was diarrhea.

**Conclusion:** The use of F75 and F100 therapeutic feed for the treatment of severe acute malnutrition were very effective with low rate of mortality.

**Key Words:** Severe acute malnutrition (SAM), Pediatric population, F75, F100 Feed, Treatment, Outcomes

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## INTRODUCTION

Acute malnutrition is one of the common disorders found all over the world. It occurs due to different infections and caused nutritional insufficiency.<sup>1</sup> This malignant disorders contains moderate acute and severe acute malnutrition.<sup>1,2</sup> It directly effects children height and weight and this nutritional defects causes high rate of morbidity and mortality. Acute malnutrition is defined as SAM when WHZ < -3, MUAC < 115 mm, and/or edema [2]. In developing countries the prevalence rate of severe acute malnutrition accounted 3% and this rate is accounted 2% in children in developing countries.<sup>3</sup>

In southern countries the incidence rate of severe acute malnutrition in children ages with 0 to 5 years is 1.9%.<sup>4</sup> In Pakistan the prevalence of severe acute malnutrition in children reported 15% as wasted and 34 percent are low weight and 43% children reported stunted according to the survey conducted to examine the prevalence of SAM in 2011.<sup>5</sup> Children with severe acute malnutrition causes physical and metabolic changes that can lead to severe disabilities and effect mental development so the better and affective treatment is much important to reduce the morbidity and mortality. For the treatment prospect WHO published a guideline for the treatment of severe acute malnutrition in children with ages less than 5 years. This treatment guideline contains F100 feeding therapeutic formulas that contain proteins, carbohydrates and sodium in specific proportion according to the needs of malnourished children. This treatment guideline is very effective and easy to apply with significant outcomes.<sup>6</sup> The mortality rate is ranging 5% to 40% and due to severe acute malnutrition the fatality rate is accounted approx 30%. WHO guideline for the treatment of SAM resulted 30% to 35% reduce in case fatality rate.<sup>7,8</sup> Severe acute malnutrition is one of the most common pediatric disorders in developing countries and it accounted 5%

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to 50% of mortality among children with ages less than 5 years. Walking difficulties, developmental complications and many other severe disorders occurs due to severe acute malnutrition. Prompt and better treatment is very helpful and effective to reduce the rate of infectious diseases.<sup>9,10</sup>

## MATERIALS AND METHODS

This prospective/observational study was conducted at Department of Pediatric Medicine Unit-3, Civil Sandeman Provincial Hospital Quetta from 1<sup>st</sup> January 2019 to 30<sup>th</sup> June 2019. Total 150 patients of both genders presented with severe acute malnutrition were included in this study. Patient's ages were ranging from 2 months to 48 months. Patients demographic including age, sex, malnutrition type and residence were recorded after taking informed consent from patient's parents/guardians. Children with surgical interventions, patient having other severe disorders and those parent/guardians who were not attended the complete treatment process were excluded from the study. All the patients had received F75 and F100 therapeutic feed. At first day 130ml/kg/day was given 2 hourly. Duration of feed was gradually increased to 3-4 hourly. F100 was added in transition phase for 2 days in same amount. During hospital stay weight gain was recorded and on discharge mean weight gain was examined. Treatment outcomes were recorded such as mortality and recovered. All the data was analyzed by SPSS 21. Mean SD was obtained for analysis. Percentages and frequency were recorded.

## RESULTS

There were 80 (53.33%) male patients while 70 (46.67%) were females. Sixty eight (45.33%) patients were ages less than 10 months and 82 (54.67%) were ages above 10 months. 100 (66.67%) patients had rural residency while 50 (33.33%) patients had urban residency. From all the patients 134 (89.33%) patients were marasmus and 16 (10.67%) patients were khwashikor (Table 1).

**Table No. 1: Demographic information of the patients**

Variable	No.	%
<b>Gender</b>		
Male	80	53.33
Female	70	46.67
<b>Age (months)</b>		
<10	68	45.33
>10	82	54.67
<b>Residence</b>		
Rural	100	66.67
Urban	50	33.33
<b>Type of SAM</b>		
Marasmus	134	89.33
Khwashikor	16	10.67

**Table No.2: Clinical presentations at the time of admission**

Presentation	No.	%
Diarrhea	75	50.0
Phneumonia	35	23.3
Hypoglycemia	20	13.33
UTI	12	8.0
Otitis Media	8	5.33

**Table 3: Treatment outcomes of severe acute malnutrition by using F100 feeding formula (WHO Guideline)**

Outcome	No.	%
Recovered	138	92.0
Died	12	8.0

Presentations at admission were recorded as diarrhea, pneumonia, hypoglycemia, urinary tract infection and otitis media in 75 (50%), 35 (23.3%), 20 (13.33%), 12 (8%) and 8 (5.33%) patients respectively (Table 2). According to the treatment outcomes we recorded mean weight gain was by using F100 was  $7.26 \pm 3.45$  gm/kg/day. 92% patients were recovered/discharge and 8% died during treatment (Table 3).

## DISCUSSION

Severe acute malnutrition is one of the most common pediatric disorders in developing countries and it accounted 5 to 50% of mortality among children with ages less than 5 years.<sup>11,12</sup> Many of treatment modalities were used for severe acute malnutrition with significantly better results but WHO guidelines for the treatment of SAM (F100 feed) showed better results with respect to weight gain and quick recovery.<sup>13</sup> The recent study was conducted aimed to examine the outcomes of F100 feeding formula for the treatment of severe acute malnutrition. In present study 150 patients were presented with severe acute malnutrition were included in which 53.33% patients were males while 46.67% were females. These results showed similarity to many other studies in which male patient's population was high as compared to females. 50% to 60%.<sup>14,15</sup> In our study majority of patients were ages above 10 months 54.67%. A study conducted by Sadia et al<sup>16</sup> regarding treatment outcomes of severe malnutrition in children reported maximum patients were ages above 6 months.

In this study we found that 100 (66.67%) patients had rural residency while 50 (33.33%) patients had urban residency. From all the patients 134 (89.33%) patients were marasmus and 16 (10.67%) patients were khwashikor. These results were comparable to some previous studies in which majority of patients belong to rural areas.<sup>17</sup> In our study we found diarrhea was the most common presentation at admission and accounted 50% of patients followed by phneumonia 23.3%, hypoglycemia 13.33%. Sadia et al<sup>16</sup> reported diarrhea

was the most common presentation in children presented with acute severe malnutrition. Many of other studies showed similarity in which diarrhea and hypoglycemia were the most common presentation found in children.<sup>18,19</sup>

In present study we found mean weight gain was  $7.26 \pm 3.45$  gm/kg/day. Many of previous studies were reported average weight gain was 4 to 12g/kg/day as treatment outcomes.<sup>20,21</sup> The mortality rate was 8% in our study and 92% patients were recovered and discharge. These results were similar o several studies in which recovered rate was 85 to 95% and mortality rate lies 5 to 30% by using F100 therapeutic feed for the treatment of severe acute malnutrition.<sup>22,23</sup>

## DISCUSSION

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## CONCLUSION

The use of F100 therapeutic feed for treatment of severe acute malnutrition was very useful and effective treatment modality with very low rate of mortality. Moreover we should provide awareness to the people about this life threatening disorder so that mortality rate could decrease.

### Author's Contribution:

Concept & Design of Study:	Saima Rayaz
Drafting:	Mohammad Iqbal
Data Analysis:	Muhammad Hussain, Attaullah Bizenjo
Revisiting Critically:	Saima Rayaz
Final Approval of version:	Saima Rayaz

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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