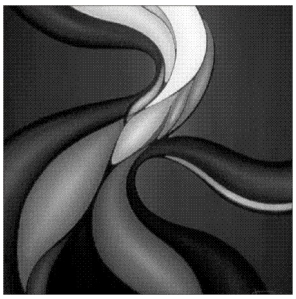
ORIGINAL PROF-824

FAILURE TO THRIVE (FTT) UNDER ONE YEAR



DR. MUHAMMAD AZAM, FCPS
Registrar,
Paediatrics Unit-I,
Nishtar Hospital, Multan.

DR. ABDUL REHMAN
Postgraduate Registrar,
Paediatrics Unit-I,
Nishtar Hospital, Multan.

DR. PERVAIZ AKBAR KHAN
Professor of Paediatrics,
Nishtar Medical College/Hospital, Multan.

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ABSTRACT... drazam9@hotmail.com. **Objectives:** The aims of this study were to find out various factors responsible for FTT in the babies less than one year and the impact of breast feeding on prevention of FTT. **Material and methods:** The sampling procedure for the cases was stratified random sampling. All cases with weight below 2nd major line were considered FTT and were included in the study. A detailed history of presenting complaints, in chronological order was inquired on prescribed performa. **Results:** In present study, FTT is mostly present among children aged 0-3 months i.e. 67%. The incidence of FTT is higher among male than female babies. FTT is present nearly twice among urban babies as compared to rural babies. FTT is mostly non-organic i.e. 86% and the common risk factors are illiteracy 75%, poverty 63%, poor sterilization 48%, absolute and partial lack of breast feeding 81%, improper dilution and hence under feeding 44% and absence of proper weaning 67%. In most of the babies suffering from severe FTT more than 4-5, risk factors are operating. In moderate FTT less than 4, risk factors are operating. **Conclusion:** As a result of this study, we have suggested preventive measures for FTT.

INTRODUCTION

Failure to thrive (FTT) during infancy is a complex problem, though diagnosis is made frequently, both the meaning of term and its value, as diagnosis has been controversial, since 50 years. Term FTT has been used to describe infants and young children whose growth is substantially less than their peers, however, despite its established status in medical terminology, the concept of FTT lacks as clarified definition and should be considered a clinical feature not a diagnosis of disease state[1].

Infants are labeled as suffering from FTT when the infant fails to meet growth potentials appropriate for the age and sex due to factors both external and/or internal[2]. Infant's physical growth or rate of growth is inadequate. The primary criterion for FTT is attained weight at that age or rate of weight gain. In more severe cases length and head circumference is affected[3].

Traditionally, the anthropometric parameters have been the major criteria for determining the optimal health and nutritional status of infants and children. Growth potential

under first few years of life, under good environmental circumstances, is very similar in different population groups though there is no general agreement on this issue[4,5,6,7].

Protocol of obtaining accurate and reproducible measurements have been well described[8,9,10]. Labeling a child with FTT has little value, since etiology is not determined at once. The condition may persist for long if underlying cause remains unknown. Therapeutic efforts to correct the patient with unknown etiology will be in vain sooner or later[3].

The meaning of term FTT, the etiology and diagnosis criteria have been under continuous change since Spitz in 1945[11] to date. Causes of FTT also varied from lack of mothering due to any reason, psychosocial problems of family, ignorance, poverty, infant behavioral abnormalities, inadequate provision and intake of food, chronic malnutrition, environmental effects upon caretaker ability, primary abnormalities of appetite of infant due to unknown etiology, lack of breast feeding due to any reason etc[3].

PURPOSE OF STUDY

The aims of this study were:-

To find out various factors responsible for FTT in the babies less than one year.

The impact of breast feeding on prevention of FTT. Importance of early detection of FTT and practical guidelines for prevention of FTT. To assess major complication of FTT leading to morbidity and mortality.

MATERIAL AND METHODS

This was a prospective cohort, open clinical study. the study population was all children, who were admitted in the pediatric medicine unit-II, Nishtar Hospital, Multan during the period of one year from 1-6-1997 to 31-3-1998. The criteria for subject selection was that all children less than one year age from any sex and from any area were included. They could be from any socio-economic class. The babies less than one year with normal weight according to the age, underweight babies with history of acute diarrhoea, under weight babies with acute history of any systemic disease or under weight babies whose age is more than one year were not included in the study.

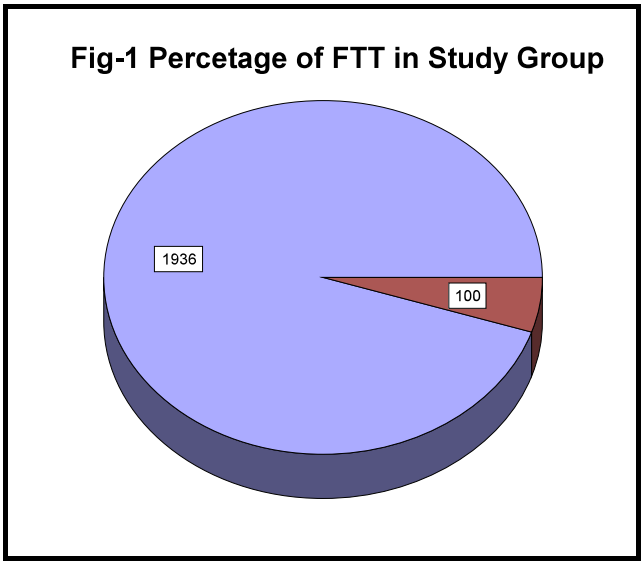
The sampling procedure for the cases was stratified random sampling. All cases with weight below 2nd major line were considered FTT and were included in the study. A detailed history of presenting complaints, in chronological order was inquired on prescribed proforma. History include detailed nutritional history i.e. type of feeding (breast feeding or top feeding), adequacy and frequency of feeding, whether the specific type was absolute or partial, if top feeding, then total amount of feed/day, its dilution and sterilization, technique or preparation and its presentation to baby. History of weaning included age of weaning and type of weaning food. History also includes the age of parents, their educational and social status according to their income. Vaccination and family history of any particular disease will also be inquired. General physical examination included pallor particularly and any other gross abnormality if present.

Anthropometric measurements were the cornerstone of the examination. Length was measured by infanto-meter. Weight was done mostly along with minimum clothing, by scale manufactured by Tanita Japan. Head circumference and mid arm circumference (MAC) were measured by ordinary measuring tape. Very few laboratory investigations were done to aid for the diagnosis of the etiology of FTT. Mostly the patients were suffering from some other acute problems super imposed on FTT and the investigations were performed to aid the diagnosis of that particular disease.

RESULTS

A total of 100 patients were diagnosed as suffering from FTT during the study period, (according to percentile chart for weight for age recommended by WHO for developing countries in a recent illustration with the topic as “Integrated management of childhood illness”). During one year study, 1936 patients less than one year age, were admitted to pediatric medicine department unit-II,

Nishtar Hospital, Multan.



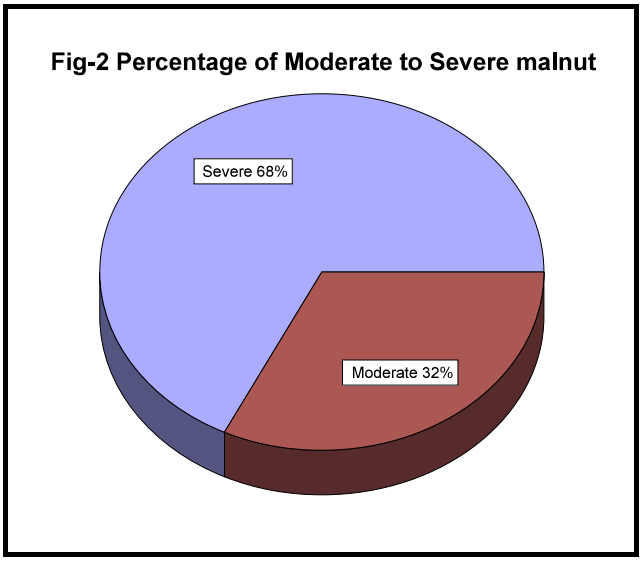


TABLE-I FTT IN GENERAL WARD			
Age	Percentage	Moderate	Severe
0-1month	4.00	0.9	3.10
1-3 months	3.20	1.4	1.80
3-6 months	1.72	0.47	1.25
6-9 months	0.55	0.16	0.39
9-12 months	0.30	0.07	0.23

TABLE-II MALE TO FEMALE RATIO			
Age	Total FTT	Male	Female
0-1month	26(04.00%)	17(26.00%)	09(01.40%)
1-3 months	41(3.1%)	30(2.34%)	11(0.86%)
3-6 months	22(1.72%)	07(0.55%)	15(1.17%)
6-9 months	07(0.55%)	05(0.39%)	02(0.16%)
9-12 months	04(0.3%)	03(0.22%)	01(0.08%)

Table-III. Risk factors for FTT in the age group 0-1 month		
Risk factors	No. of Pts	%age
Illiteracy	20	76.0
Poverty	18	72.0
Absolute lack of breast feeding	11	42.0
Under feeding	11	42.0
Poor sterilization	07	27.0
Low birth weight	15	58.0
Upset parents	06	23.0
Additional feeds	04	15.0
Large family size	03	12.0
Foster mother	03	12.0
Previous admission	04	15.0
Associate disease	01	04.0
Vaccination Yes No	 03 23	 11.5 88.5

Figure-1 shows that out of 1936, 100 (5.16%) were confirmed to be suffering from FTT.

Above figure shows that out of 100 patients suffering

from FTT, 32 suffered from moderate FTT and 68 suffered from severe FTT. A total of 654 neonates were admitted during study period. Out of those 26 suffered from FTT which is 26% of the patients suffering from FTT less than one year but it is 4% of total nursery admission. Out of these, 6 (0.9%) suffered from moderate and 20 (2.1%) from severe FTT. So neonates are more vulnerable to severe FTT than moderate FTT. Out of remaining 1274 patients, 74 babies suffered from FTT between age 1 month to 1 year in general ward admission. Distribution is shown in follow table.

Table-IV Risk factors for FTT in the age group 1-3 months

Risk Factors	No of pts	%age
Illiteracy	30	76.0
Poverty	30	72.0
Absolute lack of breast feeding	20	42.0
Under feeding	14	42.0
Poor sterilization	23	27.0
Low birth weight	08	58.0
Upset parents	03	23.0
Additional feeds	08	15.0
Large family size	06	12.0
Foster mother	03	12.0
Previous admission	04	15.0
Associate disease	NIL	14.0
Vaccination		
Full	08	19.5
Partial	04	09.8
No	29	70.7

As a whole:

Severe FTT 68%
Moderate FTT 32%

Out of total admission of 1936 in pediatric unit

Severe FTT 3.50%
Moderate FTT 1.65%

Out of 100 FTT patients 62 were males and 38 were females. So male to female ratio is 1.6:1. It means prevalence of FTT is more in males than females. As it is obvious from table-I, this distribution is present in all age groups except in 3-6 months age group where female sufferers are more as compare to males.

In the present study following risk factors contributing to FTT in different age groups (Table-III, IV, V, VI,VII).

It is clear from the following that in present study FTT is more common in the male babies (17) as compared to the female babies (9). Out of 26 babies who suffered from FTT, 15 (58%) were from urban area and 11 (42%) were from rural area. This indicates that urban babies are more prone to suffer from FTT as compared to rural babies.

Table- V Risk factors for FTT in the age group 3-6 months

Risk Factors	No of pts	%age
Illiteracy	17	76.0
Poverty	08	72.0
Absolute lack of breast feeding	06	42.0
Under feeding	06	42.0
Poor sterilization	12	27.0
Low birth weight	09	58.0
Upset parents	03	23.0
Additional feeds	NIL	15.0
Large family size	03	12.0
Foster mother	NIL	12.0
Previous admission	02	15.0
Associate disease	03	04.0

Vaccination		
Full	04	18.0
Partial	03	13.5
No	15	68.0

Table-VI Risk factor for FTT in the age group 6-9 months

Risk Factors	No. of pts	%age
Illiteracy	5	76.0
Poverty	4	72.0
Absolute lack of breast feeding	-	42.0
Under feeding	4	42.0
Poor sterilization	4	27.0
Low birth weight	-	58.0
Upset parents	-	23.0
Additional feeds	2	15.0
Large family size	-	12.0
Foster mother	-	12.0
Previous admission	-	15.0
Associate disease	-	04.0
Vaccination		
Full	-	-
Partial	7	100.0
No	-	-

Table- VII Risk factors for FTT in the age group 9-12 months

Risk Factors	No. of pts	%age
Illiteracy	3	76.0
Poverty	3	72.0
Absolute lack of breast feeding	-	42.0
Under feeding	2	42.0
Poor sterilization	2	27.0
Low birth weight	-	58.0
Weaning	02	09.0
Upset parents	1	23.0
Additional feeds	-	15.0
Large family size	-	12.0
Foster mother	-	12.0
Previous admission	-	15.0
Associate disease	-	04.0
Vaccination		
Partial	2	50.0
No	2	
Weaning	4	100 delayed

Table-VIII Urban to Rural Ratio

Age group	Environment	No. of pts	%age
0-1 months	Urban	15	58.0
	Rural	11	42.0

DISCUSSION

This is a hospital based study, while other studies conducted in different countries including Pakistan were community based studies. Patients were admitted with complaints like not gaining proper weight, reluctant to feed and chronic diarrhoea (which is starvation diarrhoea most of the time).

Incidence of FTT is equal 5.16% in this hospital study since birth to one year. This is equal to the incidence reported by Powel and Low[12] i.e. 1-5% in less than one year babies. The incidence reported by Casy[13] also approximates to present study. He states that this problem accounts for about 1% of all pediatric admission and is estimated to occur in 10% of young children. According to state of world's children 1995, 40% of the children less than 5 years are malnourished. It does not mention the incidence less than one year and also the

incidence in inpatient hospital admissions. Since this incidence is of general population, incidence in hospital admissions will be equal to about 5% less than one year.

Incidence reported in a study is 5-10%, in those who are low birth weight and poor[14]. This incidence is again community based and not hospital based. In the hospital, incidence is in the diseased children and not mixed population. The incidence of malnutrition in babies less than one year reported in a study[15] is total malnutrition (58%), moderate protein calories malnutrition (PCM) (17%) and severe protein calories malnutrition (26%). This study is an outpatient-based study at National Institute of child health Karachi. This study also compares the normal children less than one year to those suffering from PCM. The reference standard is also National Centre for Health Statistics, USA (NCHS) charts. Present study is an inpatient study that compares the incidence of under nourished children less than one year to other diseased children. In this study percentage of severe malnutrition is 26% versus 17%. This incidence is approximately same as in present study i.e. 68% versus 32%. The incidence of PCM is also high among those who are totally or partially bottle-fed and also among those who are not weaned. Same results are present in our study.

There is also difference of diagnostic techniques in our study and other studies. Other authors have used percentile charts designed by NCHS but we have used the percentile chart designed by UNICEF for developing countries. In this chart standards for normal health are lower than NCHS.

Regarding as far as male to female ratio is concerned; it is 62% to 38% in present study. This ratio is 1:1 in another study[16]. This study is less than 5 years and concerns to the urban area of Karachi where educational standard is high as compared to Multan. In Karachi probably, male and female children gain near to same importance and taken to the hospital with equal vigilance. Here in Multan, male children gain more importance and they are taken to the hospital more anxiously during disease as compared to female babies and therefore high incidence of male sufferers of FTT. In the study of Bairgi, malnutrition is more prevalent among female babies[17]. This is community based study, where male babies receive more care as compared to females and hence they are less prone to suffer from FTT. Male to female ratio is 54% to 46% in a study[16]. This ratio is also nearly equal to my study i.e. 62% to 38%.

So far as risk factors are concerned, in present study, more than 4-5 risk factors are operating in most cases of severe FTT and less than 4 risk factors are present in moderate FTT. This also conforms to the study of Arif F[16]. In this study 4 or less risk factors are operating in 19% patients of malnutrition while 5-8 risk factors are operating in 63% of patients.

In our study most common risk factors are illiteracy (75%), poverty (63%), absolute lack of breast feeding (37%), poor sterilization (48%), improper dilution (44%), under feeding (37%) and partial breast feeding (44%). From above it is clear that percentage of both absolute and partial lack of breast feeding is 81%. Weaning is present in only 11% of cases from 0-1 year age group. If we consider weaning from 3-12 months of age, it is present in only 33% of patients. In many patients weaning is not proper. The above percentage of different risk factors also conforms to many studies like the study of Arif F[16], where illiteracy and poverty is 94% and 97%, over dilution is 84%, weaning is 36% at 6 months, deficient feeding is 51% and low birth weight is 31%. Approximately same results are reported in other studies[18,19,20,21], if we consider the ratio of non-organic to organic FTT.

If we consider the ratio of organic and non-organic FTT, associated disease and previous hospital admissions are present in 14% of patients in our study. So organic FTT is present in 14% of patients and hence FTT is mostly non-organic in present study. This also conforms to the most of other studies[22]. In present study [partial feeding (combination feed)] is present in 44% of cases.

Defective weaning is important risk factors for FTT. In this study it has come out as 33% in weaning group. According to National Nutrition Survey 1988, only 1/3rd of

children aged 7-9 months consumed food other than milk even at 12-24 months only 50-70% of all children ate any food other than milk. Study by Karkal[23] demonstrated that 18% of infants in Bombay and its suburbs were receiving solids at 6 months. Shekar[24] from India and Vansteen Berger[25] from Indonesia also reported inadequate weaning.

Low birth weight as contributing factors to FTT is found in 25% of children as reported by "State of World's Children 1995[26]". Its contribution is 31% in present study. It is high since this study is hospital based.

Vaccination is an important preventive measure against many communicable diseases. These diseases are important risk factors in promoting FTT. In our study, overall only 31% babies are immunized. Out of these half are partially immunized. From the table it is also clear that with increasing age, immunization status is better as compared to earlier age group. This is because the parents become more aware and convinced for vaccination, as the child grows older.

The aim of present study was not only to assess the magnitude of problem and effects of different risk factors, but also the effect of improved nutrition as treatment for FTT advised. But unfortunately, only 3 patients came back after discharge from hospital, so follow up of patients was absolutely in failure. We were not able to assess the effects of correction of different risk factors.

CONCLUSION

Incidence of FTT in babies less than one year diagnosed by newly constructed charts by UNICEF for developing countries in hospital admissions is similar to most of the worlds, though that incidence depends upon NCHS charts and is community based. In UNICEF charts standards for normal weight for age and standards for weight that falls in category of FTT are low as compared to NCHS.

As far as risk factors are concerned, these are similar to most of other parts of worlds especially in developing countries. FTT is mostly non-organic in our hospital-based study and it is more prevalent in urban and male babies. Treatment is mostly nutritional and results are good especially for moderate FTT.

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Name Zareena Sarfraz
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Age 66 y Sex Female
Address C/o Faisalabad
Grammar High School, Fsd.
No. 01

SHAFFEE MEDICAL CENTRE
175-JINNAH COLONY, FAISALABAD
TEL: +92 41 617122-24, FAX: +92 41 623413
editor@fsd.paknet.com.pk