



NUTRITIONAL ASSESSMENT AND OUTCOME ANALYSIS IN PAEDIATRIC BURN PATIENTS: A PROSPECTIVE OBSERVATIONAL STUDY

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Abstract

Background:

Children are a high-risk group for burn injuries due to their curiosity and limited ability to recognise danger. Nutritional support plays a pivotal role in paediatric burn management, aiming to counter hypermetabolic stress, promote wound healing, and prevent complications related to under- or over-feeding.

Objectives:

To assess the nutritional status and adequacy of calorie intake in paediatric burn patients and to analyse its relationship with clinical outcomes including wound healing and mortality.

Methods:

A prospective observational study was conducted over six months (June – November 2024) in the Department of Burns, Plastic and Reconstructive Surgery, Government Kilpauk Medical College, Chennai. Twenty children aged 1–6 years with 20–50% total body surface area (TBSA) burns admitted within 48 hours of injury were included. Calorie requirements were calculated using the Schofield formula, and intake was monitored using daily dietary records. Serum albumin levels were measured twice weekly to assess nutritional adequacy. Outcomes assessed included wound healing, need for grafting, and mortality.

Results:

Among 20 patients (8 males, 12 females), 16 (80%) survived and 4 (20%) expired. Five patients (25%) were undernourished, of whom four died. Two patients (10%) were over nourished, and both survived. Patients achieving $\geq 80\%$ of calorie requirements showed earlier wound healing and higher

survival. Mean serum albumin among survivors was 2.25 g/dL, compared with 1.97 g/dL in non-survivors.

Conclusion:

Proper nutrition also has a direct effect on recovery and survival of paediatric burn patients. The constant observation of the calorie adequacy and serum albumin is helpful in optimising nutrition in a timely manner and enhances clinical outcomes.

Keywords: Paediatric burns; nutrition; outcome; wound healing; calorie intake; protein balance

Introduction

Children with burn injuries continue to cause a high morbidity and mortality in developing nations. Burns elicit a hypermetabolic effect due to the physiological stress, which causes rapid catabolism of muscle and adipose tissue, defective wound healing, and susceptibility to infection. Paediatric burn care thus involves the use of nutritional support. The present study aimed to evaluate the nutritional status of paediatric burn patients, assess the adequacy of calorie intake during hospital stay, and analyse its relationship with clinical outcomes including wound healing and survival.

Materials and Methods

A prospective observational study was conducted in the Department of Burns, Plastic and Reconstructive Surgery, Government Kilpauk Medical College, Chennai, over six months (June – November 2024).

Study population

20 children aged 1–6 years with 20–50 % total body surface area (TBSA) burns admitted within 48 hours of injury.

Exclusion criteria

Children with inhalational injuries, sepsis on admission, or comorbidities affecting metabolism.

Nutritional assessment

Caloric requirement was calculated using the Schofield formula with stress and activity factors. Daily oral or enteral intake was recorded. Calorie adequacy (%) = (actual intake / calculated requirement) × 100. Serum albumin was measured twice weekly.

Outcome measures

Clinical outcomes recorded were wound-healing time, grafting requirement, complications, and mortality. Data were analysed descriptively.

Results

Demographic Profile

Table 1. Schofield formula used for calculating caloric requirement in paediatric burn patients

SCHOFIELD FORMULA		
AGE	GENDER	FORMULA
0 -3yrs	Mch	59.5*wt – 30.33
	Fch	58.3*wt – 31.33
3 -6yrs	Mch	22.7*wt + 505
	Fch	20.3*wt + 486

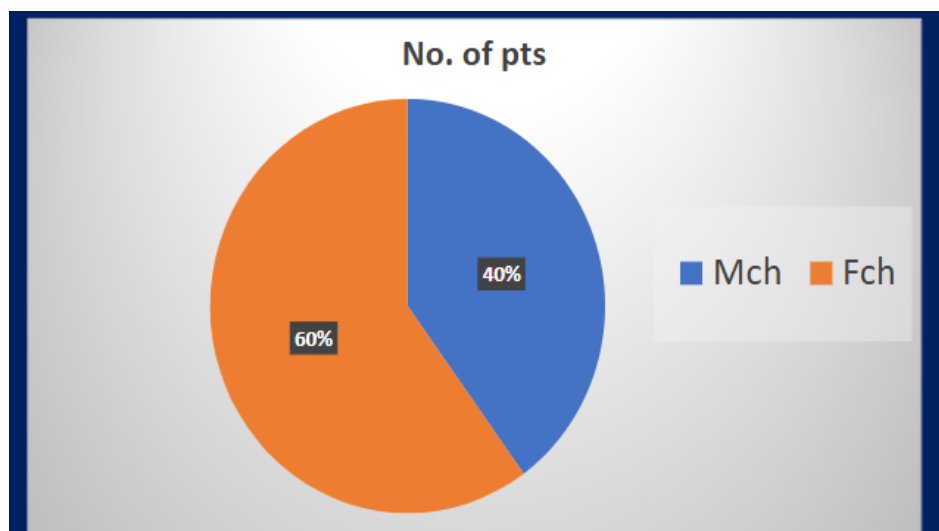


Figure 1. Gender distribution among paediatric burn patients

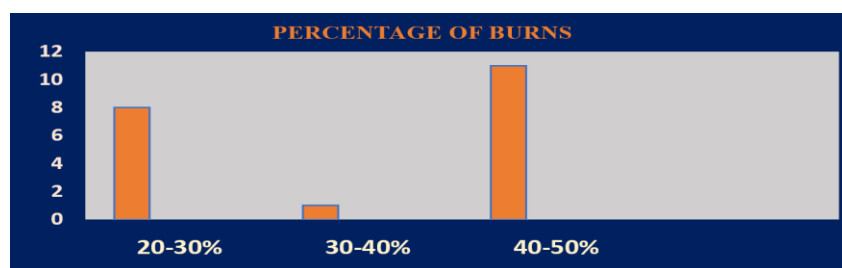


Figure 2. Percentage of total body surface area (TBSA) affected

Table 2. Distribution of paediatric burn patients according to percentage of burns and burn depth

Percentage of Burns	Superficial Burns	Deep Burns
20 -30%	4	3
30 -40%	1	0
40 – 50%	4	4

Type of Burn Injury

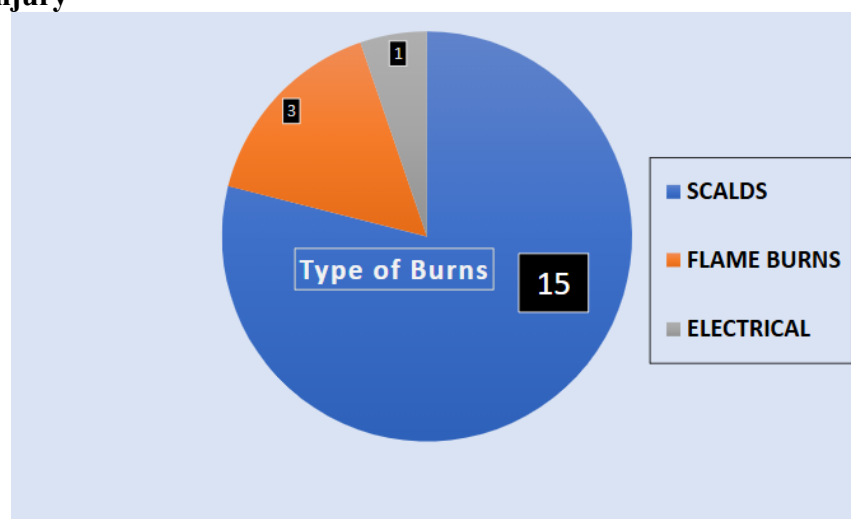


Figure 3. Type of burn injury

Calorie Adequacy and Outcome

Calorie intake varied from 60 % to 110 % of calculated requirements. Patients achieving ≥ 80 % adequacy demonstrated faster wound healing and better graft uptake.

Table 3. Relationship between calorie adequacy and wound-healing outcome

Percentage of Calorie requirement	No. of patients
<80%	5
80 -110%	13
110%	2

Serum Albumin and Recovery

Mean serum albumin among survivors was 2.25 g/dL versus 1.97 g/dL in non-survivors, indicating a positive association between nutritional status and recovery.

Discussion

Adequate nutritional intake is a cornerstone of paediatric burn management. The catabolic response to thermal injury markedly increases energy and protein requirements; failure to meet these needs prolongs healing and increases mortality. In the present study, undernourished children experienced delayed epithelialisation and higher mortality. Similar observations were reported by O'Brien et al. (2024), who emphasised early initiation of enteral feeding and close monitoring of protein intake. Serum albumin was a convenient non specific measure of nutritional adequacy. Patients who had albumin of over 2g/dL healed earlier and needed fewer grafting sessions. These results highlight the need to do regular nutritional assessment, supplement on time and multidisciplinary burn care.

Conclusion

Nutritional evaluation and nutrition support of at least 80 percent of the estimated caloric needs of the paediatric burn patient have a great effect on healing and survival. Routine monitoring of calorie adequacy and serum albumin should be incorporated into standard burn management protocols.

References

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