

Knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burns

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Abstract

Introduction: The skin is the body's largest sensory organ, covering the body in addition to serving as a protective shield against heat, light, injury and infection the skin also regulates body temperature. Stores water and fat prevents the entry of bacteria which also act as a sensory organ.

Circulating blood volume decreases dramatically during burn shock. In addition evaporative fluid loss through the burn wound may reach 3 to 5 liters or more over 24 hour period until the burn surface are recovered. During burn shock, serum sodium levels vary in response to fluid resuscitation. Hyponatremia is common during the first week of the acute phase, as water shifts from the interstitial to the vascular space immediately after burn injury. Hyperkalemia (excessive potassium) results from massive cell destruction. Hypokalemia (potassium depletion) may occur later with fluid shift and inadequate potassium replacement.

Aim: The study is conducted to assess the knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses.

Materials and Methods: Quantitative approach and descriptive survey design are used to conduct the study in Narayana Medical College Hospital, Nellore, among 100 staff nurses selected by non-probability convenient sampling technique. Data was collected using structured questionnaire. Data was analyzed using descriptive and inferential statistics.

Results: The study showed that level of knowledge regarding fluid and electrolyte replacement therapy for patient with burns among 100 samples, 15(15%) have adequate knowledge, 62(62%) have moderately adequate knowledge and 23(23%) have inadequate knowledge. The study shows that practice regarding fluid and electrolyte replacement therapy for patient with burns among working nurses and 37(37%) safe practice 42(42%) moderately safe practice and 21(21%) have unsafe.

Conclusion: In the present study the following conclusion were between from finding study. The nurse had adequate knowledge regarding fluid and electrolyte replacement therapy and they are able to safely practice the fluid and electrolyte replacement.

Keywords: electrolyte replacement therapy, sensory organ, burn wound, inferential statistics

Introduction

The skin is the body's largest sensory organ, covering the body in addition to serving as a protective shield against heat, light, injury and infection the skin also regulates body temperature. Stores water and fat prevents the entry of bacteria which also act as a sensory organ.

Thermal injury to skin results in lot of systemic changes. The most significant among these being alterations in fluid and electrolyte balance oedema formation in areas of burns and this occurs due to gross fluids shift and this forms the basis of burn shock.

Circulating blood volume decreases dramatically during burn shock. In addition evaporative fluid loss through the burn wound may reach 3 to 5 liters or more over 24 hour period until the burn surface are recovered. During burn shock, serum sodium levels vary in response to fluid resuscitation. Hyponatremia is common during the first week of the acute phase, as water shifts from the interstitial to the vascular space immediately after burn injury. Hyperkalemia (excessive potassium) results from massive cell destruction. Hypokalemia (potassium depletion) may occur later with fluid shift and inadequate potassium replacement. At the time of injury some red blood cells may be destroyed leading to anaemia. Blood loss during surgical procedure and ongoing hemolysis further contribute to anaemia. Blood transfusions are required periodically to maintain adequate hemoglobin levels for

oxygen delivery. Abnormalities in coagulation including decreased platelets, prolonged clotting and prothrombin time also occur with burn injury. (ABRNS, 2004)

The average water loss in a burns patient is about 100-300 ml per hour. The amount of water loss may reach as high as 350 ml per hour is an extensive burn. There is a need to not only replace water loss but also to provide for the energy requirement.

Role of nurse in fluid and electrolyte replacement therapy is very much mandated one the nurse should need a very essential and reliable knowledge regarding fluid and electrolyte replacement therapy. Because it is the foremost and only one way to support the care and saving the life of burns patient which is more than 50% and critical care needed.

Main types of fluid used in the fluid management.

- Ringer lactate
- Hyper tonic solution
- Protein infusion
- Isotonic crystalloids

I. Evans Formula

Requirement for first 24 hours

- Colloids: 1 ml / Kg / % Burns
- Physiologic Saline : 1 ml / Kg / % Burns
- 5% Dextrose In Water: 2000cc in adults and proportionally less in children

Requirement for Second 24 Hours

- Fluid Requirement is half of the first 24 hour period.

II. Brookes Formula

Requirement for 1st 24 hours

- Colloids: 0.5 / kg / % burns
- Lactated ringers : 1.5 ml / kg / % burns
- Water requirement: (Dextrose in water) 2000CC in adults and proportionately less in children

Requirement for 2nd 24 hours

- The colloids and crystalloid requirement is half of the first 24 hours period.

III. Parkland Formula

Requirement for the 24 hours

- Ringers lactate 4 ml X Kg X % burns
- Half this amount is administered in first post burns
- ¼ the amount given during 8-16 hours post burnt
- ¼ the amount given decreasing 16-24 hours post burnt.

IV. Muir and Barclay Formula

$$\frac{\% \text{ Burn X kg Body Weight}}{2} \text{ X ml}$$

Statement of Problem

A study to assess the knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses working in NMCH, Nellore.

Objectives

- To assess the knowledge regarding the fluid and electrolyte replacement therapy for patient with burns among staff nurses in NMCH.
- To identify the practice regarding fluid and electrolyte replacement therapy for patient with burns over staff nurses.
- To correlate knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses and demographic variables.
- To associate knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burs among staff nurses and demographic variables.

Methodology

Quantitative approach and descriptive survey design are used to conduct the study in Narayana Medical College Hospital, Nellore. The study is conducted on 100 staff nurses selected by non-probability convenient sampling technique who fulfilled the inclusion criteria.

Data Collection

Data collection is done with the help of tool which consists of three parts.

Part A: The demographic variables data include the age, sex, education, experience, religion, area of work, designation etc.

Part B: Questionnaire which consists of 40 questions to assess the knowledge regarding the fluid and electrolyte replacement therapy for burn cases among staff nurses.

Part C: Check list with 20 items used was to assess the practice regarding fluid and electrolyte replacement therapy for burns cases among staff nurses.

Score Interpretation

The scoring system is adopted by giving one mark to correct response and zero mark to the wrong response. In the check list the maximum score is 20.

Part A: It deals with knowledge regarding the fluid and electrolyte replacement therapy for burns cases.

Score	Interpretation
25-40	Adequate Knowledge
10-24	Moderately Adequate Knowledge
Below 10	Inadequate Knowledge

- It deals with the practice regarding the fluid and electrolyte replacement therapy for burns cases.

Score	Interpretation
15-20	Safe Practice
7-14	Moderately safe practice
1-6	Unsafe Practice

Results

Table 1: Frequency and percentage distribution of knowledge regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses.

S. No	Knowledge	Frequency	Percentage (%)
1.	Adequate knowledge	15	15
2.	Moderately adequate knowledge	62	62
3.	Inadequate knowledge	23	23

Table – 1 shows that level of knowledge regarding fluid and electrolyte replacement therapy for patient with burns among 100 samples, 15(15%) have adequate knowledge, 62(62%) have moderately adequate knowledge and 23(23%) have inadequate knowledge.

Table 2: Frequency and percentage distribution of practice regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses.

S. No	Practice	Frequency	Percentage (%)
1.	Safe practice	37	37
2.	Moderately safe practice	42	42
3.	Unsafe practice	21	21

Table – 2 shows that practice regarding fluid and electrolyte replacement therapy for patient with burns among working nurses and 37(37%) safe practice 42(42%) moderately safe practice and 21(21%) have unsafe.

Table 3: Correlation between the knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses.

S. No		Mean	Median	Mode	Standard deviation	Correlation
1.	Knowledge	17.76	22	20	6.47	+ 0.47
2.	Practice	12.85	17	13	4.30	

Table-3 shows the correlation coefficient between level of knowledge and practice regarding fluid and electrolyte replacement therapy for patient with burns shows + 0.47 which

indicate a positive correlation, so the sample who are having knowledge regarding fluid and electrolyte replacement therapy able to safely administer for the burns patient.

Table 4: Association between demographic variables and knowledge regarding fluid and electrolyte replacement therapy for patient with burns among staff nurses

S. No	Demographic variables		Level of knowledge						Chi square
			Adequate		Moderate		Inadequate		
			No	%	No	%	No	%	
1.	Age	a) 21-30 yrs	9	9%	56	56%	0	0%	X ² =79.06 df=6 12.59 Significant
		b) 31-40 yrs	1	1%	6	6%	23	23%	
		c) 41-50 yrs	5	5%	0	0%	0	0%	
2.	Religion	a) Hindu	3	3%	28	28%	0	0%	X ² =38.8 df=6 12.59 Significant
		b) Christian	5	5%	10	10%	23	23%	
		c) Muslim	5	5%	20	20%	0	0%	
		d) Others	2	2%	4	4%	0	0%	
3.	Marital status	a) Married	7	7%	10	10%	1	1%	X ² =29.67 df=4 9.48 Significant
		b) Unmarried	6	6%	50	50%	2	2%	
		c) Widow	2	2%	2	2%	0	0%	
4.	Education	a) ANM	6	6%	22	22%	1	1%	X ² =52.0 df=4 9.48 Significant
		b) GNM	4	4%	20	20%	10	10%	
		c) B.Sc (N)	5	5%	20	20%	12	12%	
5.	Year of experience	a) 1 yr	9	9%	20	20%	3	3%	X ² =25.3 df=6 12.59 Significant
		b) 1-2 yrs	0	0%	20	20%	20	20%	
		c) 3-4 yrs	3	3%	18	18%	0	0%	
		d) 5 yrs	3	3%	4	4%	0	0%	
6.	Designation	a) Staff nurse	6	6%	40	40%	20	20%	X ² =10.3 df=4 9.48 Significant
		b) Nursing Incharge	6	6%	18	18%	2	2%	
		c) Nursing supervisor	3	3%	4	4%	1	1%	
7.	Area of work	a) General ward	2	2%	10	10%	10	10%	X ² =17.08 df=4 9.48 Significant
		b) General surgical ward	5	5%	32	32%	3	3%	
		c) ICU	5	5%	12	12%	10	10%	
		d) Others	3	3%	8	8%	0	0%	

Table-4 shows that there is a significant association between level of knowledge of fluid and electrolyte replacement therapy

for patient with burns with age, religion, marital status, education, year of experience, designation and area of work

Table 5: Association between practice regarding fluid and electrolyte replacement therapy for patient with burns and demographic variables among staff nurses.

S. No	Demographic variables		Level of knowledge						Chi square
			Adequate		Moderate		Inadequate		
			No	%	No	%	No	%	
1.	Sex	a) Male	17	17%	2	2%	1	1%	X ² =25.88 df=2 5.96 Significant
		b) Female	20	20%	4	4%	20	20%	
2.	Religion	a) Hindu	12	12%	18	18%	11	11%	X ² =30.45 df=6 12.59 Significant
		b) Christian	18	18%	10	10%	10	10%	
		c) Muslim	5	5%	20	20%	0	0%	
		d) Others	2	2%	4	4%	0	0%	
3.	Type of family	a) Joint family	8	8%	18	18%	1	1%	X ² =13.53 df=4 4.48 Significant
		b) Nuclear family	26	26%	20	20%	20	20%	
		c) Extended family	3	3%	4	4%	0	0%	
4.	Income	a) 1000-5000	30	30%	14	14%	1	1%	X ² =36.9 df=6 12.59 Significant
		b) 5000-10,000	4	4%	24	24%	16	16%	
		c) 10,000-15,000	3	3%	4	4%	4	4%	
5.	Duration of working hours	a) 10 hr/day	10	10%	10	10%	10	10%	X ² =5.624 df=6 12.59 Significant
		b) 6 hr/day	23	23%	30	30%	10	10%	
		c) 8 hr/day	4	4%	2	2%	1	1%	
6.	Year of experience	a) 1 yr	23	23%	8	8%	1	1%	X ² =58.8 df=6 12.59 Significant
		b) 1-2 yrs	10	10%	10	10%	20	20%	
		c) 3-4 yrs	1	1%	20	20%	0	0%	
		d) 5 yrs	3	3%	4	4%	0	0%	
7.	Designation	a) Staff nurse	28	28%	18	18%	20	20%	X ² =20.52 df=4 9.48 Significant
		b) Nursing incharge	5	5%	20	20%	1	1%	
		c) Nursing supervisor	4	4%	4	4%	0	0%	

Table-5 shows that there is a significant association between the practice regarding fluid and electrolyte replacement therapy

for patient with burns with sex, religion, type of family year of experience and designation.

Implication of the Study

Nursing Practice

- Protocol on fluid and electrolyte can be prepared and placed in the burns unit for easy practice.

Nursing Education

- Nursing educator need to plan for CNE regarding to the fluid and electrolyte administration and management for patient with burns.
- The faculty members have to motivate the students in group discussions and educate regarding importance of fluid and electrolyte replacement therapy for patient with burns among working nurses.

Nursing Administration

- The present study proposed to help the administrators for conducting the health care educational programmes regarding fluid and electrolyte replacement therapy for patient with burns, nurses to give a better quality of life with patient.
- Administrators should motivate the nurse to involve in scientific meeting regarding fluid and electrolyte replacement therapy for patient with burns.

Recommendations

On the basis of the findings of the study the following recommendations have been made.

- A similar study can be replicated on large sample size indifferent settings, with indifferent population as a longitudinal study.
- A similar study can be done by experimental and control group.

Conclusion

In the present study the following conclusion were between from finding study.

The nurse had adequate knowledge regarding fluid and electrolyte replacement therapy and they are able to safely practice the fluid and electrolyte replacement.

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