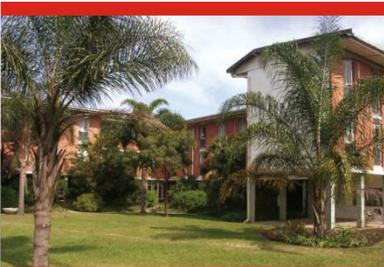




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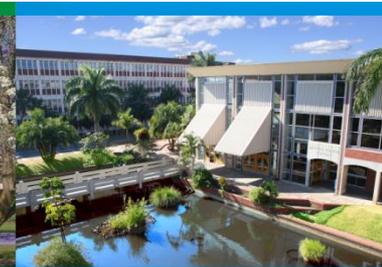
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Prognostic significance of hypernatremia in children with severe traumatic brain injury managed at a regional referral unit in Durban, South Africa

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IALCH
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INTRODUCTION

- **TBI major cause of death and disability in children.**
- **Increased vascular permeability, cerebral oedema, and elevated intracranial pressure (ICP)**
- **Hypernatraemia - might help control cerebral oedema.**
- **Hypernatraemia is a frequent in NICU (neurosurgical intensive care unit)(7 - 9%)**
- **Role of hypertonic saline**
- **Disordered consciousness**

AIMS AND OBJECTIVES

AIM:

- **To investigate the association of hypernatremia and mortality in children with severe TBI, managed at Inkosi Albert Luthuli Central Hospital (IALCH).**

OBJECTIVES:

- **Reviewed the clinical electronic charts of children diagnosed with severe TBI, and managed in IALCH, between 01 January 2013 and 31 December 2017.**
- **To identify whether hypernatremia in TBI is an independent predictor of mortality.**
- **To determine the prevalence of Central Diabetes Insipidus (CDI) in children with severe TBI.**
- **To establish a link between CDI and mortality**

STUDY DESIGN AND METHODOLOGY

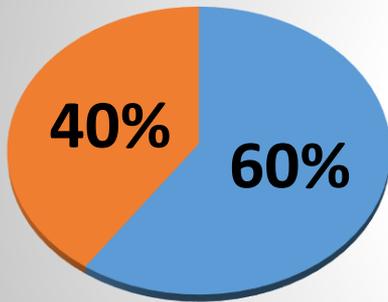
A retrospective, observational, case-control study.

Consecutive cases of children (<12 yrs) diagnosed with severe TBI, and managed in IALCH, between 01 January 2013 and 31 December 2017

- **Hypernatraemia was defined as an elevated serum sodium > 149 mmol/l on two separate samples within 24 hours.**
- **Polyuria was defined as an increase in the hourly diuresis of more than 3 ml/kg/hour for 2 or more consecutive hours.**
- **Central diabetes insipidus was defined polyuria (UO>20mls/hr or >3mls/kg/hr); high serum sodium; dilute urine (urine osmolality <200moSm/L).**
- **Descriptive statistics such as frequencies and percentages were used to summarise categorical variables.**
- **Pearson chi-squared test was used to test for association between hypernatremia and mortality, with the level of significance set at <0.05.**

RESULTS

Demographics of patients



n = 166

median age = 6 yrs

female: male = 1:2

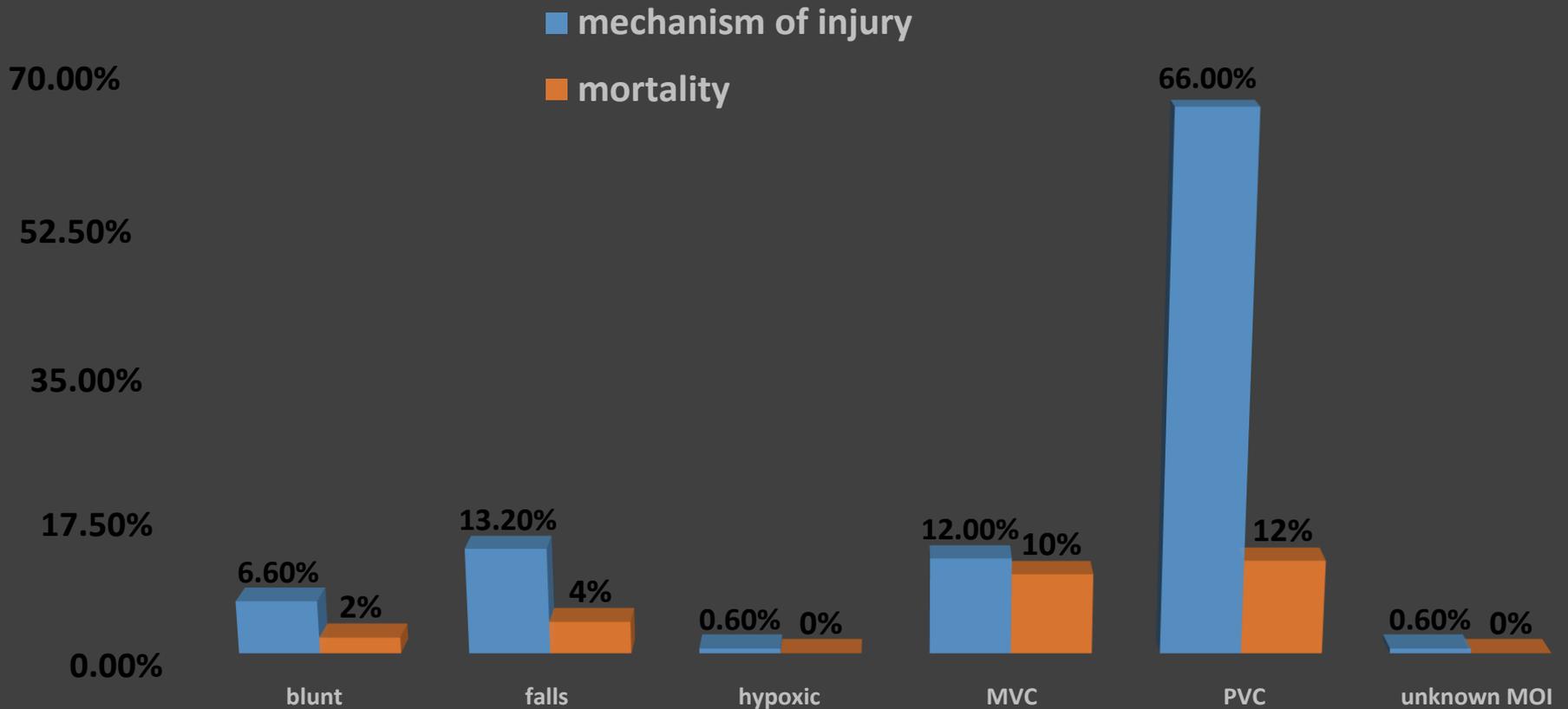
■ male
■ female

RESULTS

BASELINE CHARACTERISTICS					
	Normal sodium n=146	%		Hypernatraemia n=20	%
Age	median 6yrs			median 6 yrs	
Gender :					
Female	56	33%	54%	11	5%
Male	90			9	8%
Type:					
Isolated HI	86	36%	51%	13	9%
Extracranial injuries	60			7	4%
ICP:			80%		
High	117/146	20%		12 /20	60%
Normal	29/146			8/20	40%
Treatment:					
Mannitol	6	4%		1	0.6%
Hypertonic saline	7	5%		0	0%
Outcome:					
Central Diabetes Insipidus	0	0%		8/20	40%
Death	11/146	7%		15/20	75%
Discharged	135/146	93%		5/20	25%

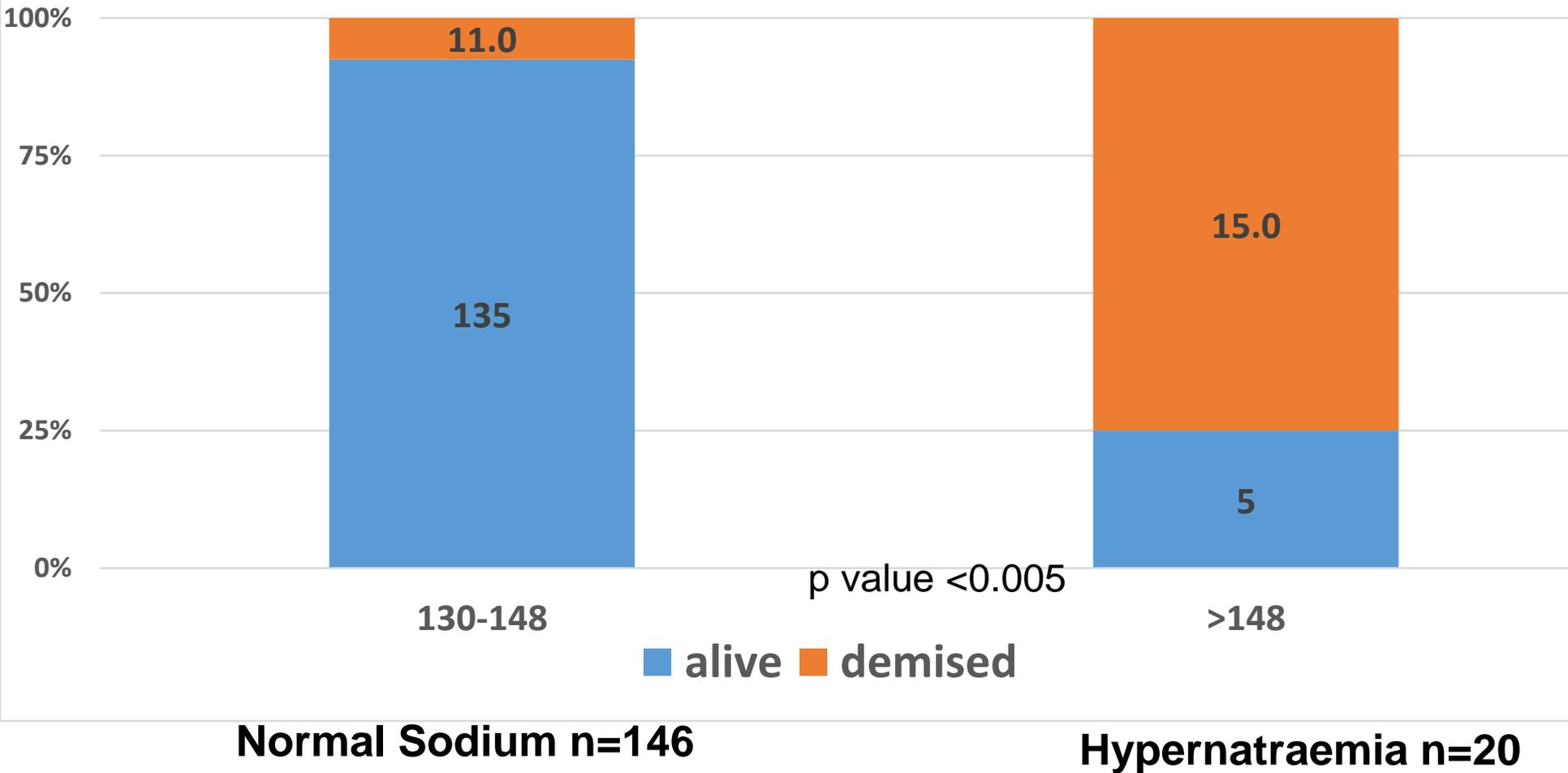
RESULTS

Distribution of mechanism of injuries

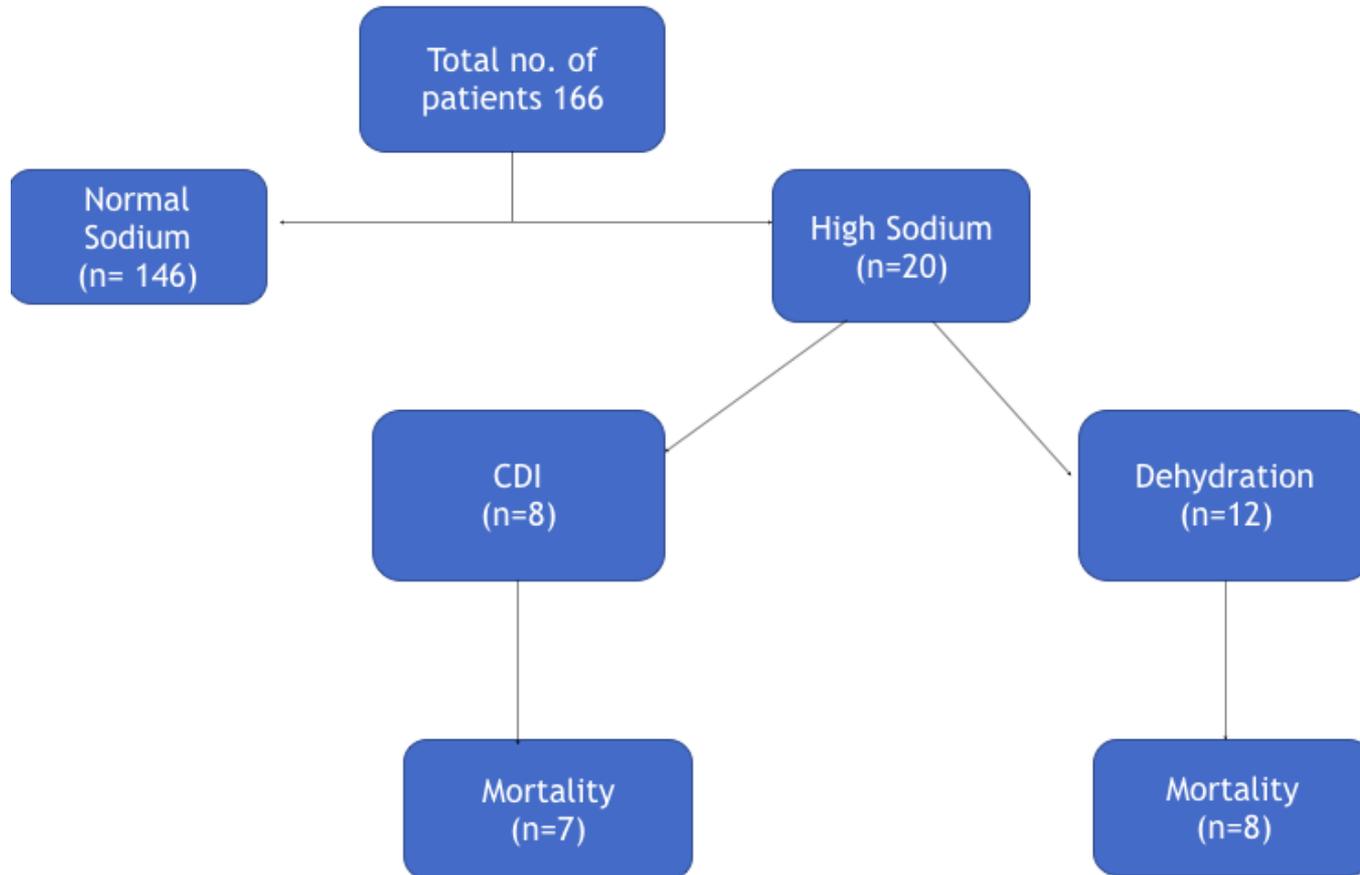


RESULTS

Sodium levels and Mortality



RESULTS



DISCUSSION

Injury, Int. J. Care Injured 44 (2013) 1213–1218



Contents lists available at SciVerse ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury



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Hypernatremia Is Associated with Increased Risk of Mortality in Pediatric Severe Traumatic Brain Injury

Ibrahim M. Alharfi,^{1,2} Tanya Charyk Stewart,^{3,4} Shawn H. Kelly,¹ Gavin C. Morrison,¹ and Douglas D. Fraser,^{1,5-9}

Med. J. Cairo Univ., Vol. 78, No. 1, June: 317-321, 2010
www.medicaljournalofcairouniversity.com

Impact of Hypernatremia on Patients with Traumatic Brain Injury

MOHAMAD SHEHATA, M.D.*; MOHAMAD KHALED, M.D.*;
DALIA RAGAB, M.D.* and MONTASSER M. HEGAZY, M.D.**

The Departments of Critical Care Medicine and Neurology**, Faculty of Medicine, Cairo University.*

Hypernatremia severity and the risk of death after traumatic brain injury

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¹Neurosurgical Intensive Care Unit, The Second Affiliated Hospital of Zhejiang University Medical School, PR China

²Department of Neurosurgery, The Second Affiliated Hospital of Zhejiang University Medical School, PR China

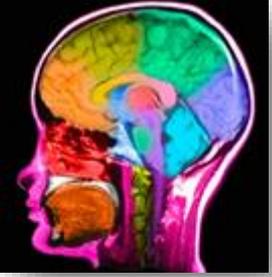
- **The incidence of hypernatraemia in our study (12%) is same as that reported in other international studies**
- **Our findings suggests that females are more likely to develop hypernatremia**
- **The causes of hypernatraemia in our patients was CDI and dehydration.**

DISCUSSION

- **Our study suggests an association between PVCs and TBI associated with extra cranial injuries - 56.7%**
- **In this group, PVC was the highest MOI (66%) also with the highest mortality (12%)**
- **Our overall mortality rate (15.6%) was lower than previously reported mortality rates for sTBI in children (24% -30%)**
- **The median sodium rate for patient who demised (155mmol/L), demonstrates that hypernatraemia can increase mortality rate.**
- **Our findings indicated CDI was prevalent in 40% of patients with hypernatraemia.**

CONCLUSION

- **Hypernatraemia is an independent predictor of mortality in children with severe traumatic brain injury.**
- **Serial monitoring of sodium in paediatric patients with sTBI is recommended.**



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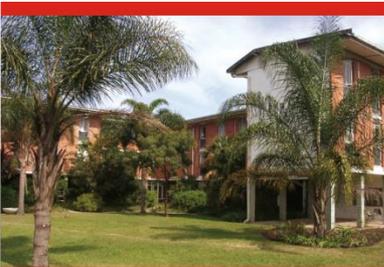
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THANK YOU

28th Society of
Neurosurgeons
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CONGRESS

In Partnership with the Society
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**CTICC • CAPE TOWN
SOUTH AFRICA
08 - 11 August 2019**



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