

EPIDEMIOLOGICAL PROFILE AND PROGNOSIS MARKERS AT ADMISSION OF CHILDREN WITH SUBMERSION ACCIDENTS

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Abstract

Retrospective study reviewing the hospital records of patients 0 to 13 years old admitted to Ped-ICU with drowning diagnosis. Patients were divided into two groups (death and survivors), comparing laboratory values and identification factors associated with poor prognosis. The predominant age was under 3 years, pool accident without adult supervision. Presence of mydriasis and elevated serum potassium at admission were identified as risk factors for death.

Key words: prognosis, submersion, pediatric.

Introduction

World Health Organization defines drowning as pulmonary damage process due to liquid submersion/immersion and classifies in four severity grades (I -> IV) by the presence of respiratory and circulatory alterations.

The occurrence of drowning presents a bimodal distribution with respect to age, with a higher prevalence in children under 5 years, followed by a second peak in young adult men.

To determine drowning's death risk markers in patients admitted to Ped-ICU is important to guide medical interventions and help to define prognosis.

Results and Discussion

We conducted a retrospective study, reviewing the hospital records of patients 0 to 13 years old admitted to Ped-ICU at our both university hospitals with drowning diagnosis from 2005 to 2013, and collecting data regarding the child, the event and the clinical and laboratorial profile at admission. Patients were divided into two groups (death and survivors), comparing laboratory values and identification factors associated with poor prognosis.

The study included 42 patients (male: 23), most patients were under 3 years old, found at the swimming pool without safety equipment or adult supervision. Regarding to aquatic environment, the swimming pool was the location of the majority of submersion events (76%), followed by lake/pond (12%), bath and bucket (both 4%) and river (2%). The period of the year when most submersion accidents occurred was October to March, which corresponds to the hottest period of the year in the region, with January being the month in which the highest number of occurrences was recorded (Image 1).

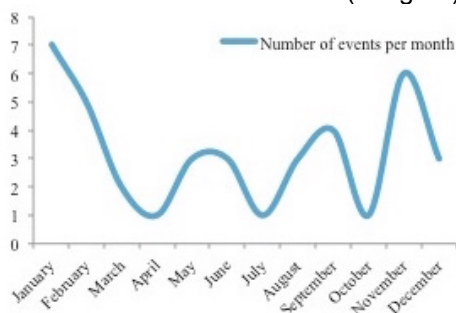


Image 1 - Distribution of accident by submersion occurrences in children admitted to intensive care, by month.

Compared to survival group, the death group had lower serum pH ($p=0.0001$) and higher levels of serum potassium ($p=0.0293$), creatinine ($p=0.0042$) and liver enzymes AST ($p=0.0018$) and ALT ($p=0.0061$). Risk factors identified for death were presence of mydriasis and high serum potassium. Protective factors for death were high levels of bicarbonate and anion gap (Chart 1)

Chart 1. Comparison of age, Glasgow coma scale score and laboratory profile between death and survival groups of child victims of submersion at admission to Ped-ICU.

Variable	Death	N	Mean	Median	S.D.	Min	Max	p-value
Age	No	28	3.63	2.88	2.73	1.00	11.25	0.1282
	Yes	14	4.95	3.50	3.35	1.83	11.75	
Glasgow	No	23	11.09	13.00	4.52	3.00	15.00	-
	Yes	11	3.00	3.00	0.00	3.00	3.00	
pH	No	26	7.32	7.34	0.12	7.03	7.53	0.0001
	Yes	11	7.01	7.03	0.23	6.55	7.31	
BIC	No	26	23.38	18.20	28.15	9.00	160.00	<0.0001
	Yes	11	9.18	7.40	4.18	5.20	18.30	
BE	No	22	-6.98	-6.00	5.45	-20.20	2.10	<0.0001
	Yes	11	-22.04	-23.10	8.60	-37.30	-8.20	
K	No	26	3.62	3.45	0.61	2.90	5.30	0.0293
	Yes	10	4.21	4.00	0.83	3.30	5.70	
Cr	No	20	0.45	0.42	0.24	0.11	1.25	0.0042
	Yes	10	0.77	0.83	0.26	0.33	1.18	
AST	No	9	93.44	60.00	55.18	39.00	179.00	0.0018
	Yes	8	586.75	430.00	391.82	105.00	1196.00	
ALT	No	9	46.00	36.00	25.33	19.00	85.00	0.0061
	Yes	8	317.63	194.50	288.36	44.00	848.00	

Conclusions

In this group of patients admitted to the PICU with submersion accident, the predominant age was under 3 years, pool accident without adult supervision. Presence of mydriasis and elevated serum potassium at admission were identified as risk factors for death.

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