

Hypoglycaemia at presentation and mortality in a pediatric intensive care unit, Koutiala, Mali

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INTRODUCTION

- International guidelines for critical care in low-resource environments often assume little or no diagnostic capability
 - This is not always the case in MSF field settings
 - Optimizing use of diagnostic tools, even simple ones, can potentially improve quality of care
- Measuring glycaemia and correcting hypoglycaemia are both simple interventions

OBJECTIVES

- Describe the prevalence of hypoglycaemia and severe hypoglycaemia on admission to the ICU
- Describe the association of hypoglycaemia with negative clinical outcomes



METHODS

Setting

- Reference Health Center of Koutiala, Mali
- More appropriately called a hospital, supported by MSF since 2009, with general paediatrics wards, neonatology unit, inpatient nutritional rehabilitation unit
- Hosts a suite of 3 intensive care units: a resuscitation room, a nutritional rehabilitation ICU and a paediatrics ICU
- >11 500 admissions to hospital among children <5yr in 2015

Data collection

- Prospective data collection on all patients admitted to one of the three ICUs between July 2015 and June 2016
- Data extracted from patient charts during first 24 hours of ICU stay, at time of discharge from ICU, and at hospital discharge
 - Vital signs and clinical symptoms over time
 - Anthropometrics
 - Physical exam findings
 - Admission and discharge diagnoses
 - Laboratory data (cultures, CBC, point-of-care haemoglobin and malaria tests, analysis of CSF)
 - Treatments received in first 24 hours

Data analysis

- All data anonymized and described using Stata
- Log-binomial regression used to calculate risk ratios associated with hypoglycaemia

RESULTS

- 3565 children admitted to ICUs over the course of the year (Figure 1, Table 1)

Figure 1: Weekly admissions to intensive care units, Koutiala Hospital, Mali, 2015-2016

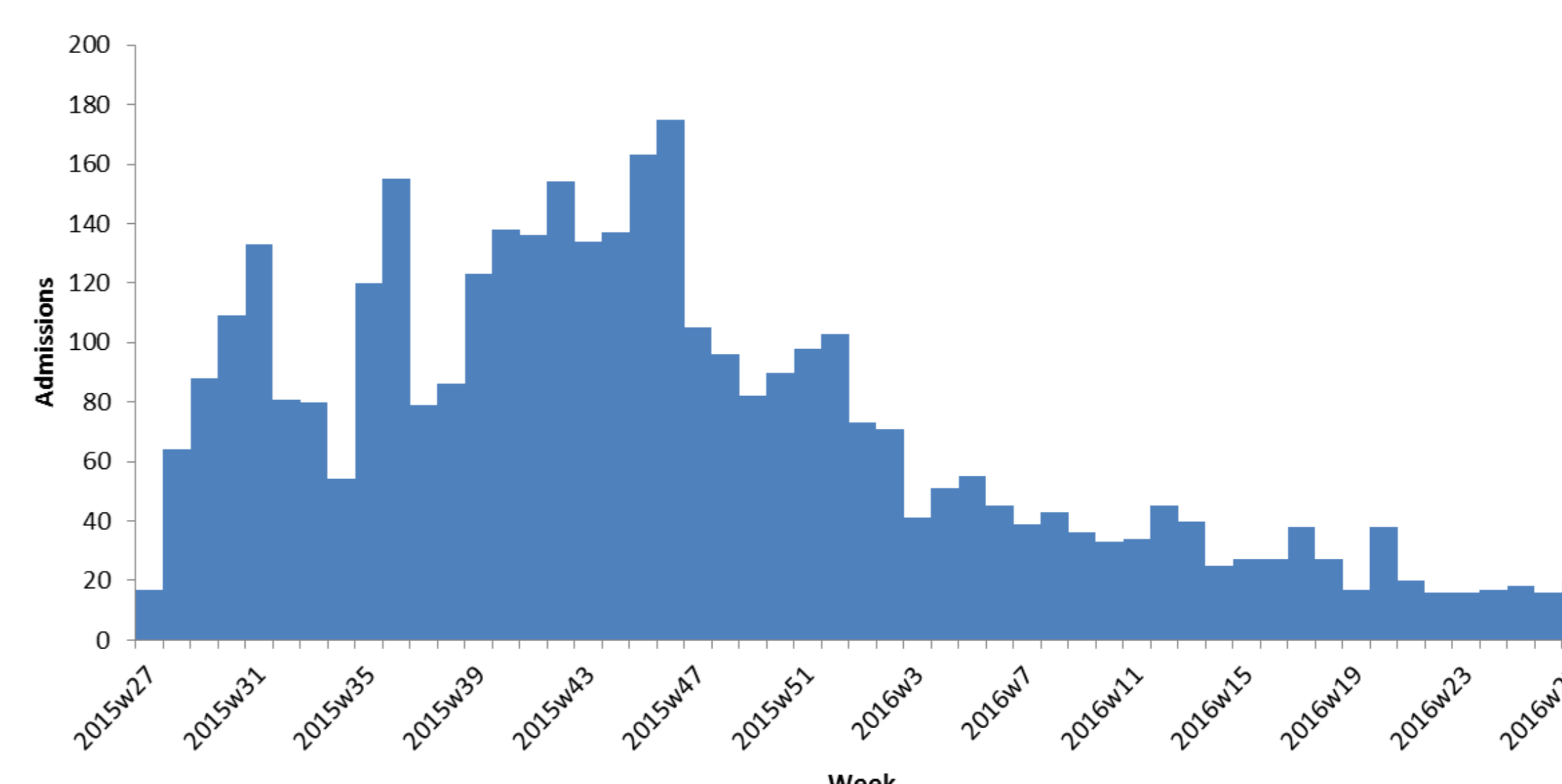


Table 1: Demographic characteristics of patients

	Pediatric ICU (N=2253)		Nutr. ICU (N=752)		Resuscitation (N=560)	
	n	%	n	%	n	%
Sex						
Male	1193	53	355	47	298	53
Female	1060	47	397	53	262	47
Age (months)						
2-11	368	16	167	22	95	17
12-23	274	12	224	30	107	19
24-35	519	23	185	25	133	24
36-47	626	28	113	15	125	22
48-59	462	21	63	8	100	18
≥60	4	0.2				
Time between onset of illness and presentation to hospital						
Same day	173	8	40	6	34	6
Next day	235	11	27	4	51	9
2-3 days	930	42	180	25	211	39
4-6 days	546	25	140	19	148	27
≥7 days	328	15	347	47	101	19
Serum glucose on admission (mg/dl)						
<60	357	16	136	19	220	40
<20	158	7	56	8	162	29

- Overall, 20% of children presented with glucose <60 mg/dl and 11% with glucose <20 mg/dl
- 144/376 (38%) children presenting with glucose <20 mg/dl died in hospital
- 76/337 (23%) of children presenting with glucose 20-59 mg/dl died in hospital
- After controlling for age, sex, and time since onset of illness, the **risk of in-hospital mortality was significantly higher in children presenting with hypoglycaemia:**
 - Glucose <20: Risk Ratio 3.7 [95%CI 3.1-4.3], p<0.001
 - Glucose <60: Risk Ratio 3.3 [95%CI 2.8-3.0], p<0.001

DISCUSSION AND CONCLUSION

- Hypoglycaemia is extremely common in this setting and is associated with very high in-hospital mortality
- Even "moderate" hypoglycemia is associated with a high case fatality rate
- Standard practice has changed at CSRef Koutiala in light of these results: all patients admitted to ICU are systematically given dextrose-containing fluids on admission