

# Diabetic ketoacidosis treatment: experience from a pediatric tertiary centre (2004-2014)

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## INTRODUCTION

Diabetic ketoacidosis(DKA) is a medical emergency. The most physiologic fluid/electrolytes replacement rates and insulin dosis are still controversial.

## PURPOSE

To evaluate the effectiveness and security of DKA treatment. Our protocol consists of 2 hours' rehydration with 0,9% sodium chloride (NaCl), followed by insulin infusion (0,1 U/kg/h) associated to 0,45% NaCl with 5% glucose. Potassium is replaced with monophosphate potassium associated to potassium chloride in the first 12 hours, when kaliemia is under 5 mmol/L. Lower insulin doses are used in children under 5 years and mild DKA (0,05U/kg/h).

## MATERIAL AND METHODS

Retrospective study including children and adolescents with DKA at 1DM diagnosis, attended at our hospital since 2004 (January/2004 to December/2014). DKA and severity groups were defined according to international literature. Data collected included insulin infusion, glycemia, pH, osmolarity, corrected sodium, potassium and phosphate along the first 12 hours. Statistical analysis: SPSS 21st (p<0,05).

## RESULTS

### DEMOGRAPHIC CHARACTERIZATION

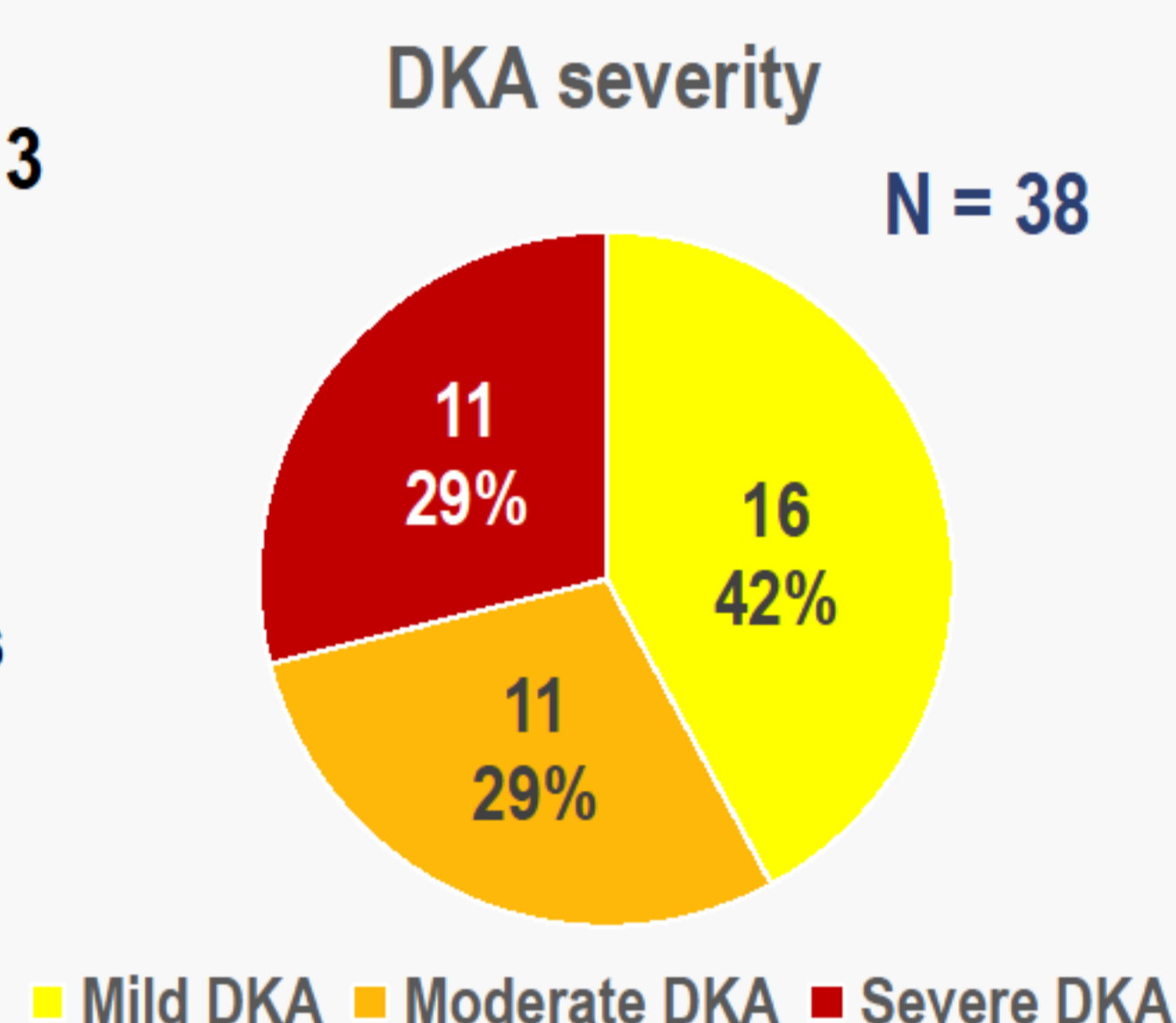
2004-2014

142 new cases of 1DM (13 new cases/year)

38 (27%) with DKA

Mean age 8,2 ± 4,0 years

23 (61%) Males



N=38	Analytical results (mean)
<b>At admission</b>	
Glycemia (mg/dL)	554 ± 154
Osmolarity (mosm/kg)	310 ± 12
Corrected sodium (mmol/L)	146 ± 5
Potassium (mmol/L)	4,5 ± 0,72
Phosphate (mmol/L)	1,5 ± 0,45

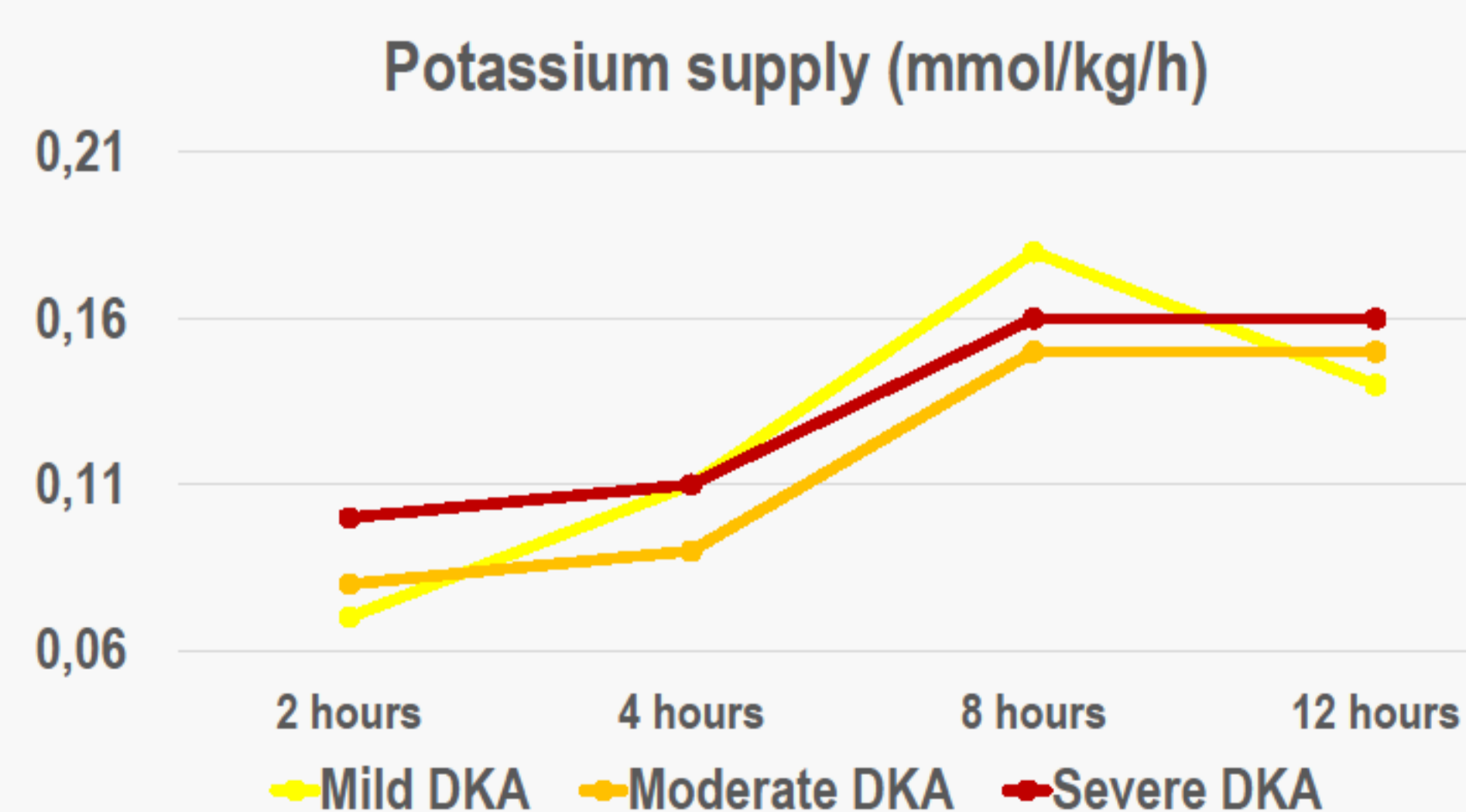
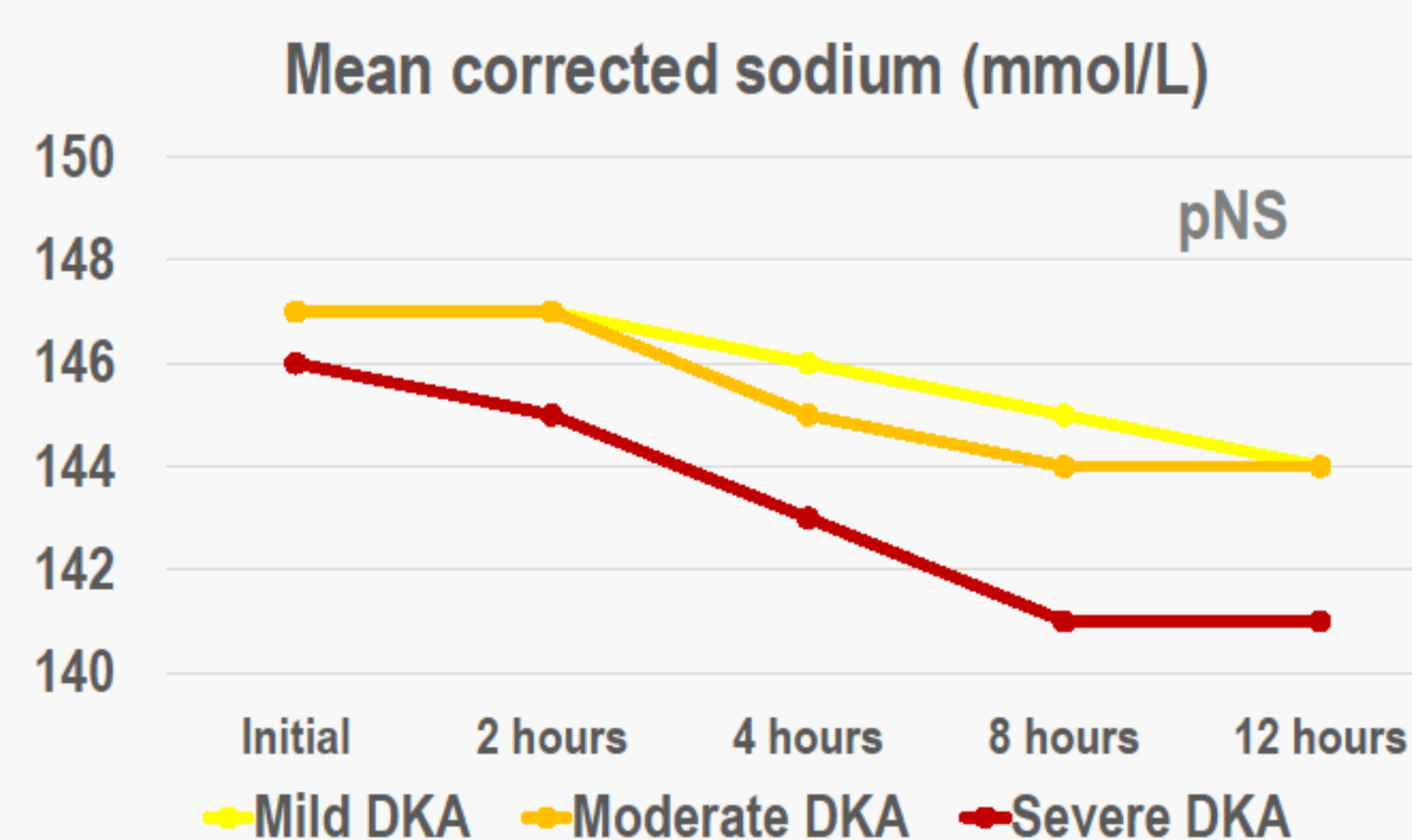
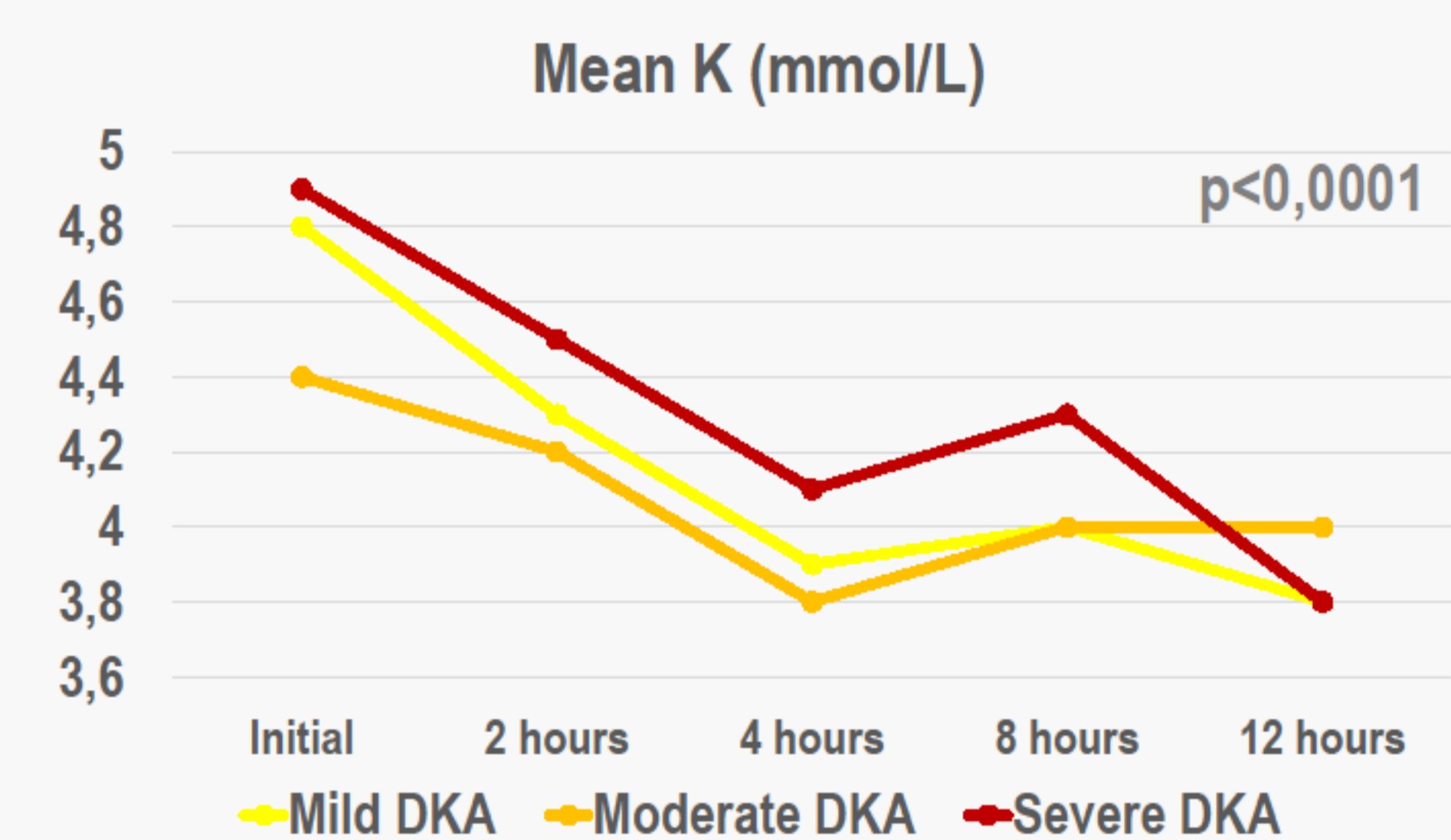
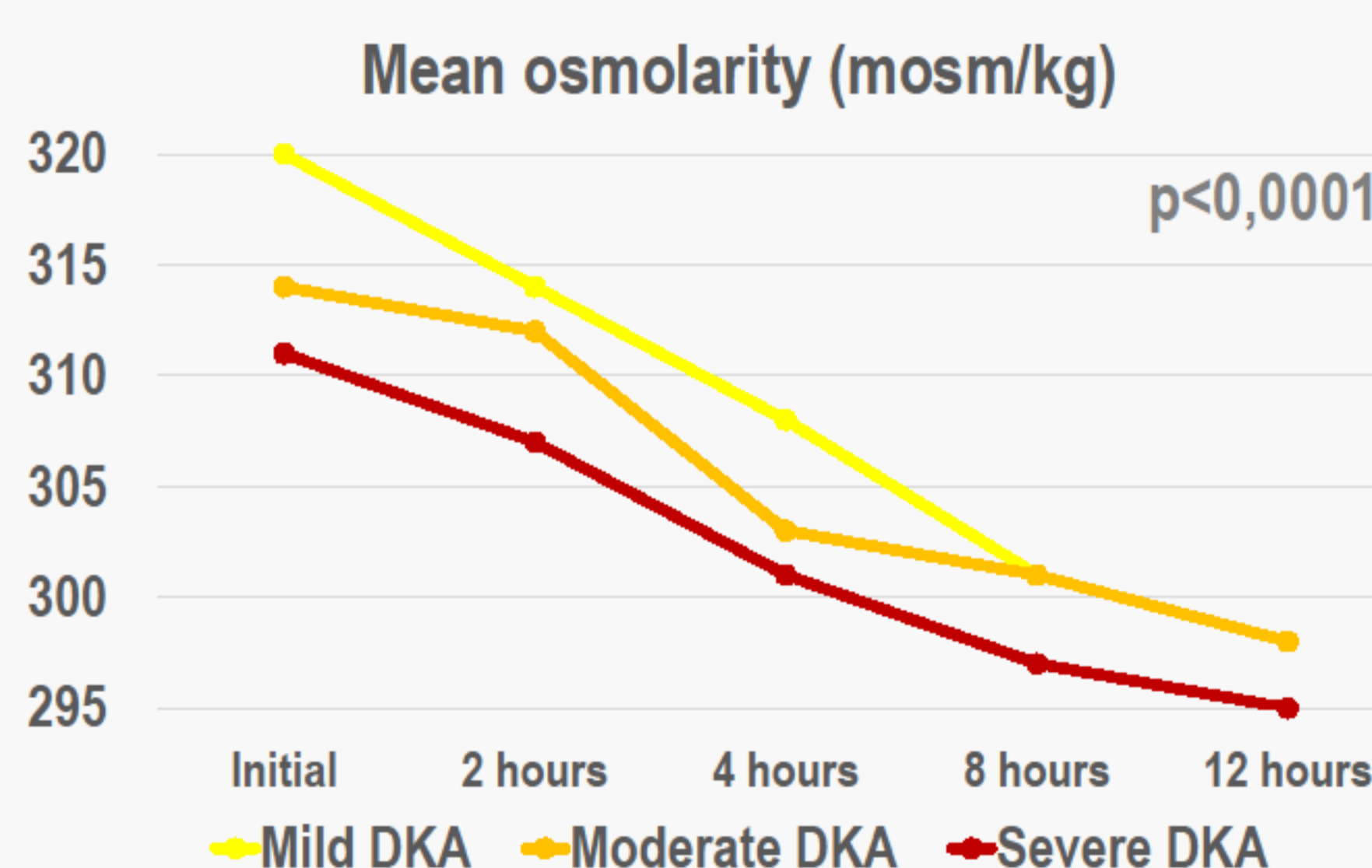
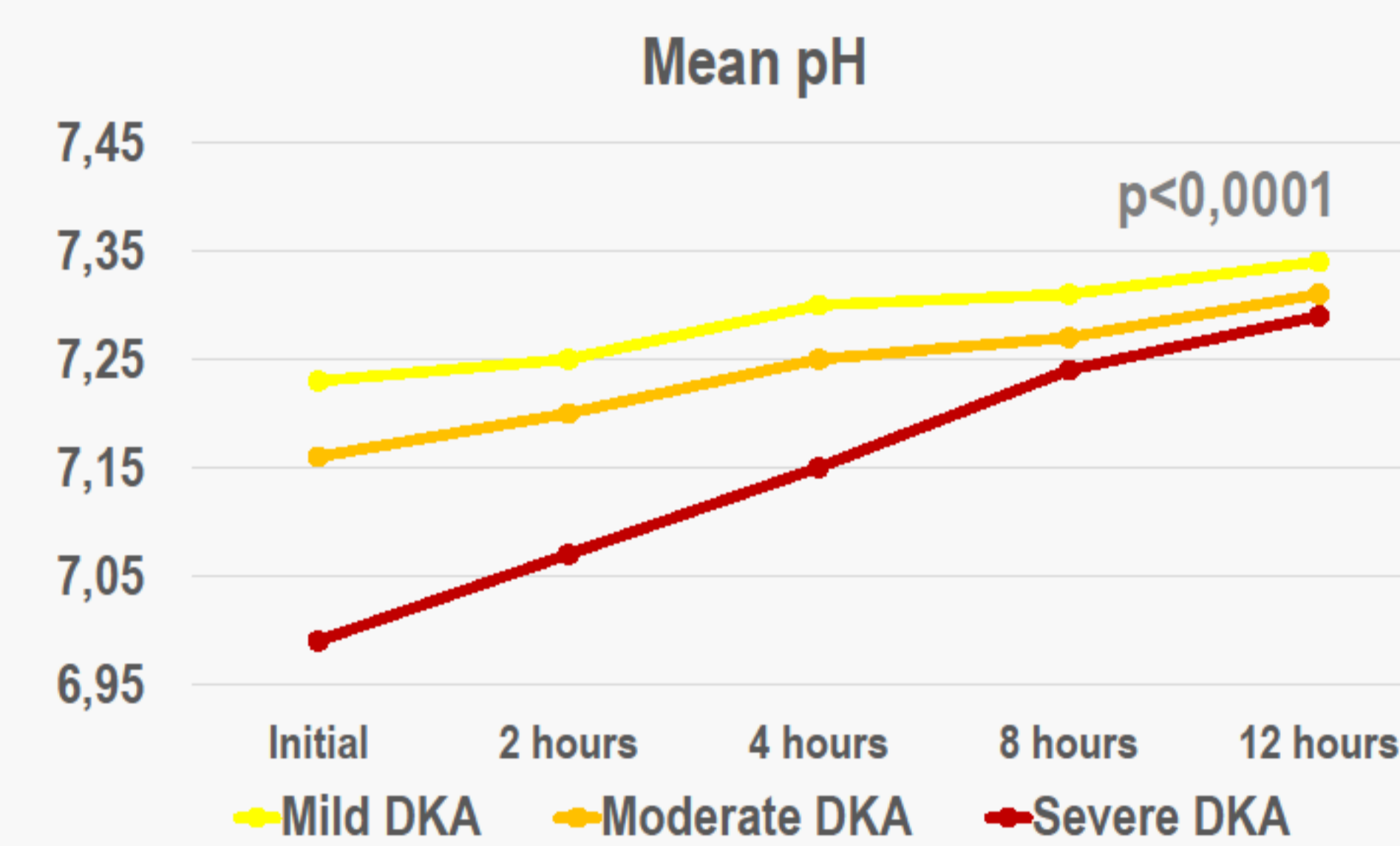
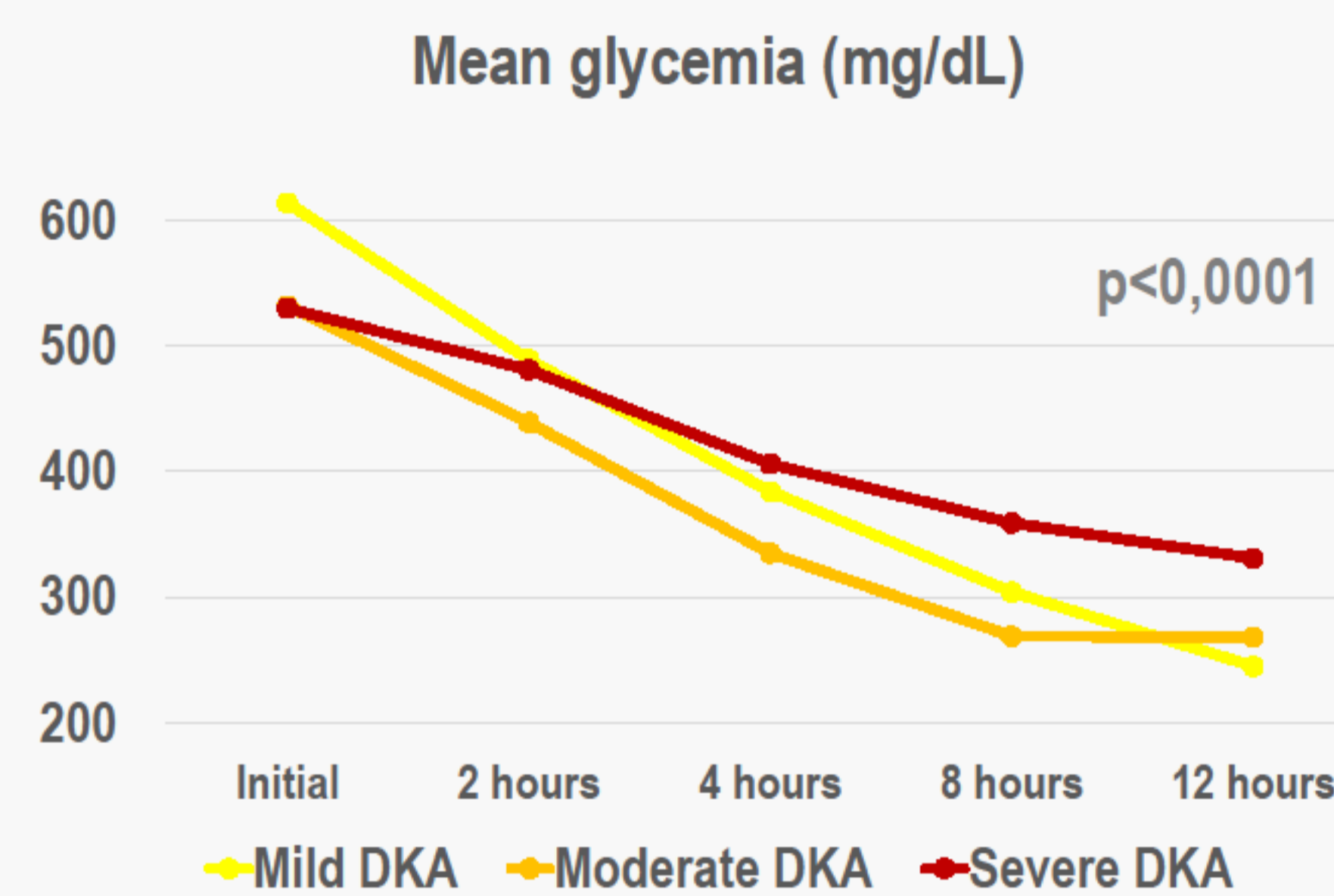
N=38	Mean doses
<b>Along 12 hours</b>	
Initial insulin infusion dosis	0,07 ± 0,02 U/kg/h
Glucose supply	4,8 ± 1,8 gr/U/h
Potassium supply	0,13 ± 0,05 mmol/kg/h
Phosphate supply	0,11 ± 0,06 mmol/kg/h

### EVOLUTION OF THERAPY

In 32 children (84%), potassium and phosphate were started simultaneously with insulin infusion.

Along the first 12 hours of insulin infusion, 16 children (42%) had hypokalemia (<3.5mmol/L); 10 children (26%) hypophosphatemia (<0.9mmol/L); no cases of hypocalcemia.

There were no cases of cerebral edema.



## CONCLUSION

Our protocol allowed an adequate and safe approach to DKA treatment at 1DM onset. We found high incidence of hypokalemia, so it should be corrected with higher potassium supply for kaliemia under 5 mmol/L. There was a gradual correction of dehydration and acidosis, without complications.

### REFERENCES

- Metzger DL. Diabetic ketoacidosis in children and adolescents: an update and revised treatment protocol. *BCM J* 2010; 52: 24-31
- Wolfdorf J, Glaser N, Sperling MA. Diabetic ketoacidosis in infants, children and adolescents – a consensus statement from the American Diabetes Association. *Diabetes Care* 2006; 29: 1150-1159
- Cocke DM. Diabetic ketoacidosis in children and adolescents. *Pediatrics in Review* 2008; 29: 424-436