CORTOIC ACIDS: RENAISSANCE OF A FORGOTTEN CLASS OF STEROIDS

M. Schauermann1, U. A. Wachter2, J. Homoki3, M. F. Hartmann1, Y. Hu4, T. Remer5 and S. A. Wudy6

1. Steroid Research and Mass Spectrometry Unit, Division of Pediatric Endocrinology & Diabetology, Center of Child and Adolescent Medicine, Justus Liebig University, Giessen, Germany
2. Department of Experimental Anesthesia, University of Ulm, Ulm/Donaue, Germany
3. Pediatric Endocrinology, University Children’s Hospital, University of Ulm, Ulm/Donaue, Germany
4. DONALD Study Center, Department of Nutritional Epidemiology, Institute of Nutrition and Food Science, University of Bonn, Dortmund, Germany

INTRODUCTION

The C21 steroidal acids (cortoic acids) (α-cortoic acid, β-cortoic acid, (α,3)cortoic acid and β-cortoic acid present the oxidative end products of cortisol metabolism1,2. They have been assumed to constitute up to 25% of total urinary cortisol metabolites3-5. However, their analysis has been difficult6-8, few data has been published in adults, and this class of steroids has become practically forgotten. Data in children are lacking completely.

AIM

• Developing a practical analytical method for quantification of urinary cortoic acids
• Establishing reference values for urinary cortoic acids excretion in healthy children

METHOD

5 ml aliquots of 24-hour urine samples were used. Sample work up consisted of solid phase extraction (C18 cartridges), strong anion exchange and derivatization. Cortoic acids were measured as 2-propylester-trimethylsilyl/ether derivatives. The quantification was done by targeted GC-MS using a nonpolar GC column.

CONCLUSIONS

• Successful development, evaluation and application of a new and less complicated method for quantification of urinary cortoic acids using GC-MS
• Establishment of reference values by using data from 240 healthy children, adolescents and young adults
• Excretion of cortoic acids increased with age.
• Cortoic acids’ share in total urinary cortisol metabolites only added up to about 1%, a percentage much lower as hitherto estimated.

REFERENCES


ACKNOWLEDGEMENTS

This work was supported by a research grant from the Deutsche Forschungsgemeinschaft (DFG grant RE 753/5 to T.R. and S.A.W.).

CONTACT INFORMATION

Steroid Research and Mass Spectrometry Unit
Paediatric Endocrinology & Diabetology
Justus Liebig University Giessen
Feuergasse 12
35392 Giessen, Germany
marcel.schauermann@paediat.med.uni-giessen.de