Circadian rhythm of salivary cortisol and cortisone in school aged children born very preterm and adequate for gestational age

M.F. OCHOA-MOLINA1, G. DOMINGUEZ-MENENDEZ2, H. POGGI3, F. ALLENDE3, S. SOLARI2, C. FARDELLA1, C. CARVAJAL1, C. CAMPINO3, R. BAUDRAND2, H. GARCIA1, R. MOORE3, I. D'APREMONT3,
A. MARTINEZ-AGUAYO3.
1. Pediatrics Division, School of Medicine, Pontificia Universidad Católica de Chile, Santiago de Chile.
2. Department of Clinical Laboratories, School of Medicine, Pontificia Universidad Católica de Chile, Santiago de Chile.
3. Endocrinology Department, School of Medicine, Pontificia Universidad Católica de Chile, Santiago de Chile.

Introduction
Higher evening cortisol level has been previously described in very preterm infants, possibly reflecting increased Hypothalamic-Pituitary-Adrenal Axis (HPA) tone or alterations in HPA regulation throughout the day. These relatively subtle differences in HPA axis function in preterm children compared to full-term children may become meaningful in terms of metabolic risk later in life, if sustained over time. Still, only a few studies have investigated whether altered reprogramming of the HPA axis persists beyond toddler age.

Aim
To compare salivary cortisol and cortisone levels and their circadian rhythm between very preterm and term school aged children, all born adequate for gestational age.

Method
In this cross-sectional study, 69 very preterm (<32 gestational weeks) and 42 full-term (>37 gestational weeks) school aged children (4.9 to 8.9 years old) were included. Cortisol and cortisone concentrations in saliva, collected in the morning, at mid-day, afternoon and before bed-time, were measured by mass spectrometry.

Results
Cortisol and cortisone levels and profiles were similar in preterm and full-term children, albeit full terms had slightly higher salivary cortisol at bedtime compared to very preterm children.

Salivary cortisol

Very preterm infant (n=69) Full-term infants (n=42) P-value

<table>
<thead>
<tr>
<th>Time</th>
<th>Very preterm</th>
<th>Full-term</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>0.18 (0.12)</td>
<td>0.19 (0.14)</td>
<td>0.86</td>
</tr>
<tr>
<td>Mid-day</td>
<td>0.057 (0.036)</td>
<td>0.075 (0.06)</td>
<td>0.38</td>
</tr>
<tr>
<td>Afternoon</td>
<td>0.04 (0.05)</td>
<td>0.054 (0.04)</td>
<td>10* 0.12</td>
</tr>
<tr>
<td>Bedtime</td>
<td>0.038 (0.54)</td>
<td>0.059 (0.10)</td>
<td>22* 0.03</td>
</tr>
</tbody>
</table>

Salivary cortisone

Conclusions
According to our data, salivary samples in very preterm and full term adequate to gestational age children showed preserved cortisol and cortisone rhythm. Also, both groups had similar levels of these hormones at each evaluated time during the day. Considering the low level of cortisol concentration below the limit of detection in saliva cortisone measurement could be prefer.

Reference

Contact Information
1. Alejandro Martínez-Aguayo
alemarti@med.puc.cl
2. Gonzalo Domínguez-Menéndez
gadoming@uc.cl