

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

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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

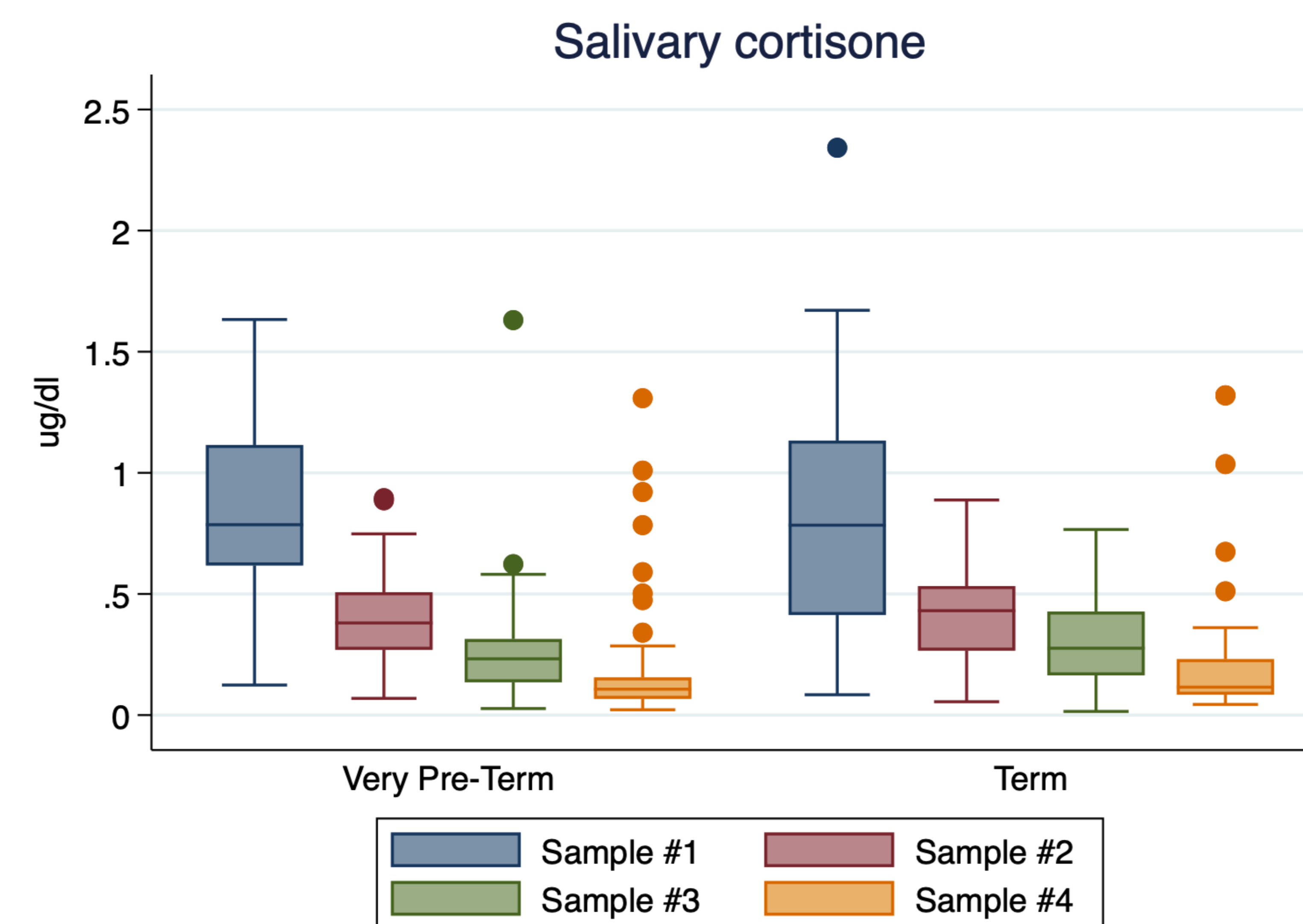
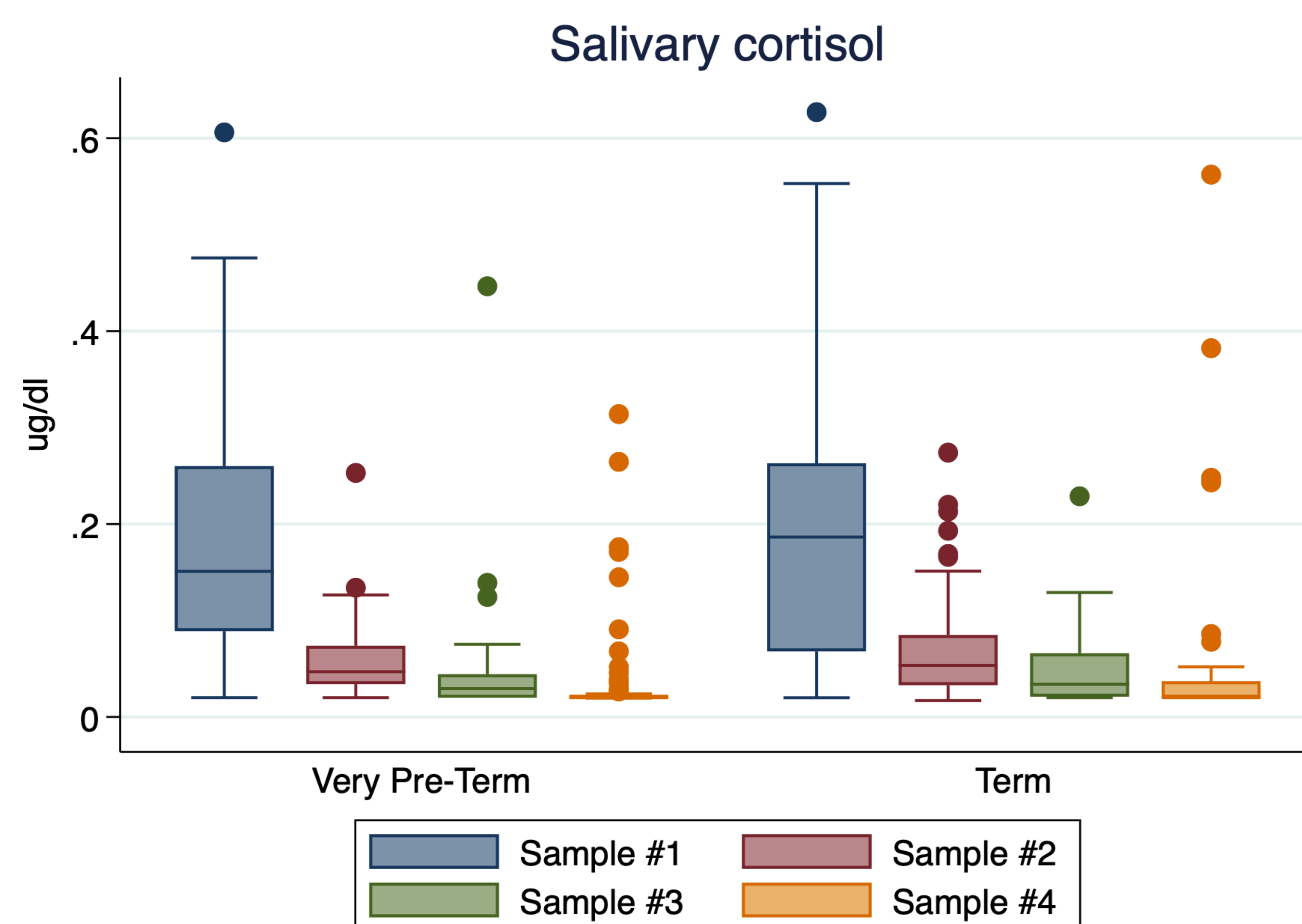
To compare salivary cortisol and cortisone levels and their circadian rhythm between very preterm and term school aged children, all born adequate for gestational age.

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.



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

| Salivary cortisol (ug/dl) | Very preterm infant (n=69) | Full-term infants (n=42) | P-value |
|----------------------------|----------------------------|--------------------------|---------|
| Morning 08:00 am | 0.18 (0.12) 3 * | 0,19 (0,14) 1* | 0.86 |
| Mid-day | 0.057 (0.036) 6* | 0,075 (0,06) 3* | 0.38 |
| Afternoon | 0.04 (0.05) 19* | 0.048 (0.04) 10* | 0.12 |
| Bedtime | 0.038 (0.54) 48* | 0.059 (0.10) 22* | 0.03 |
| Salivary cortisone (ug/dl) | Very preterm infant (n=69) | Full-term infants (n=42) | P-value |
| Morning 08:00 am | 0.82 (0.38) 0 | 0.81 (0.49) 0 | 0.76 |
| Mid- day | 0.39 (0.17) 0 | 0.42 (0.20) 0 | 0.51 |
| Afternoon | 0.25 (0.20) 0 | 0.30 (0.18) 1** | 0.09 |
| Bedtime | 0.18 (0.23) 0 | 0.23 (0.3) 0 | 0.09 |

Results are expressed in mean (standard deviation).

* Number of results below detection limit.

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

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