# Segmental Hair Cortisol in the Evaluation of Cushing Syndrome

Mihail Zilbermint[1,2,3*], **Aaron Hodes**[1*], Amit Tirosh[1], Jerrold Meyer[4], Elena Belyavskaya[1], Charalampos Lyssikatos[1], Kendra Rosenberg[4], Maya B. Lodish[1], Constantine A. Stratakis[1]

[1] Section on Endocrinology and Genetics, Program on Developmental Endocrinology and Genetics, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, MD, USA; [2]Johns Hopkins University School of Medicine, Division of Endocrinology, Diabetes, and Metabolism, Baltimore, MD, USA; [3]Suburban Hospital, Bethesda, MD, USA; [4]Department of Psychological and Brain Sciences, University of Massachusetts, Amherst, MA, USA
* First co-authors

NIH *Eunice Kennedy Shriver* National Institute of Child Health and Human Development
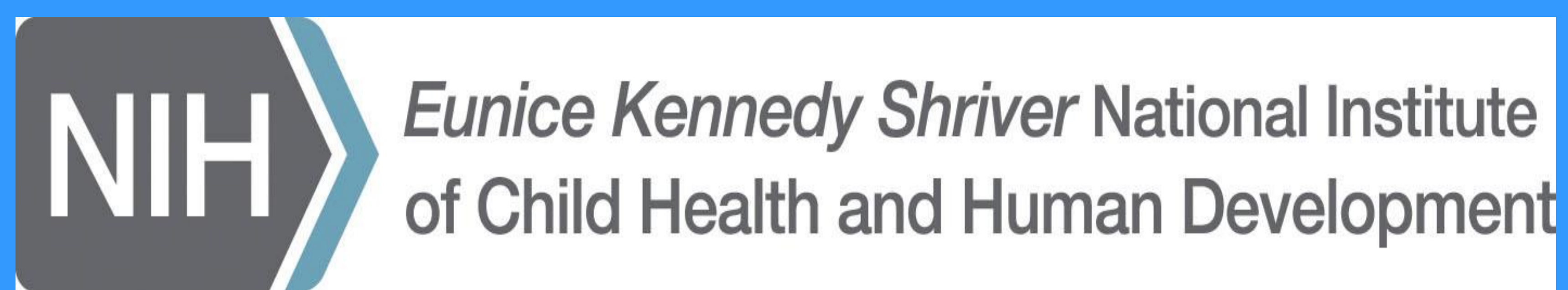
INTRODUCTION

Diagnosing Cushing Syndrome can be challenging and may require repeated testing for confirmation[1,2]. Hair cortisol evaluation has been recently used to help detect patients with suspected Cushing syndrome (CS)[3] and presents as a convenient alternative with the unique ability for retrospective evaluation of hypercortisolemia over months[4]. We sought to evaluate cortisol exposure in the proximal 3 cm of hair in patients evaluated for CS at the NIH Clinical Research Center from September 2013-January 2015.
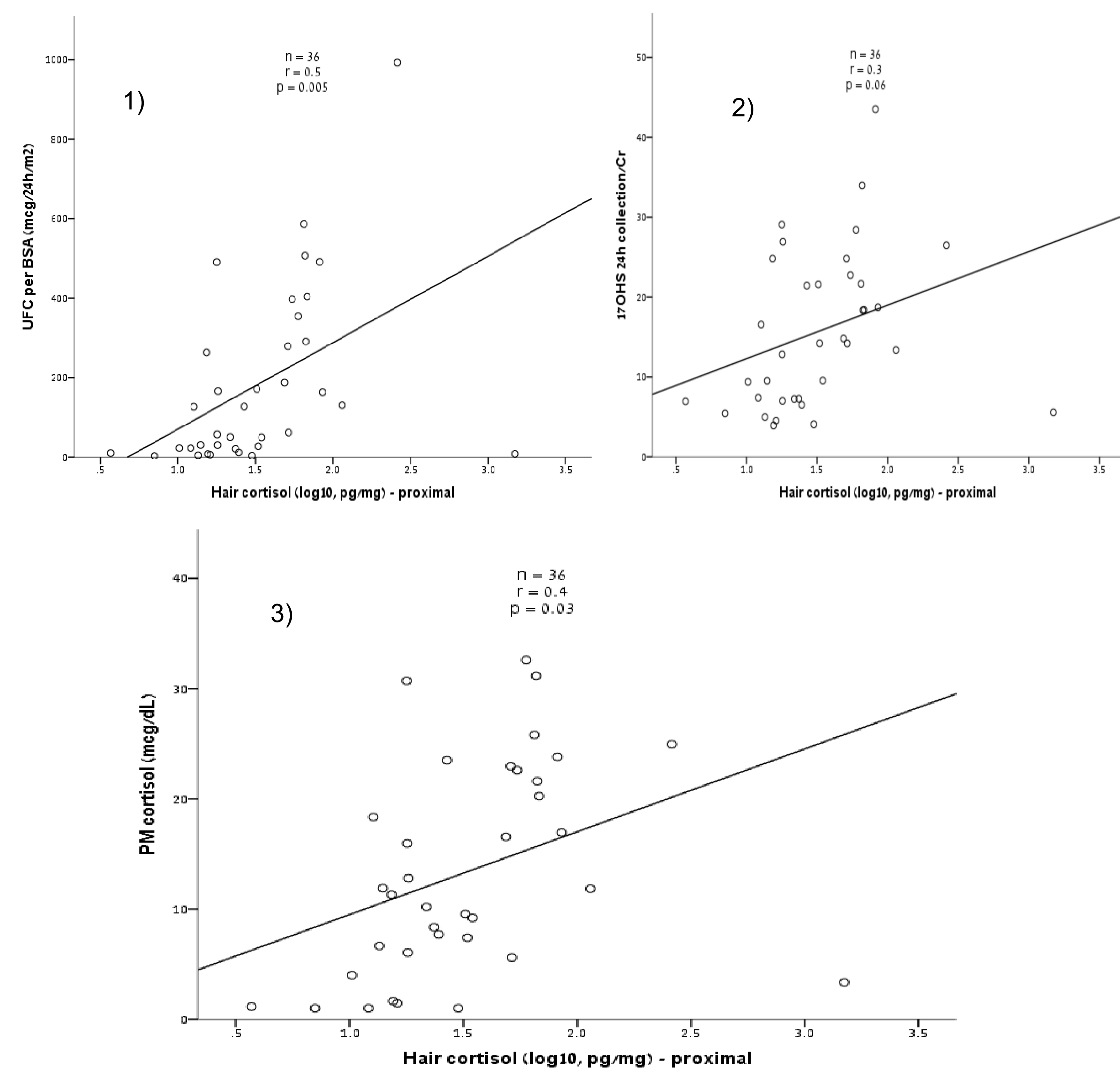
METHODS
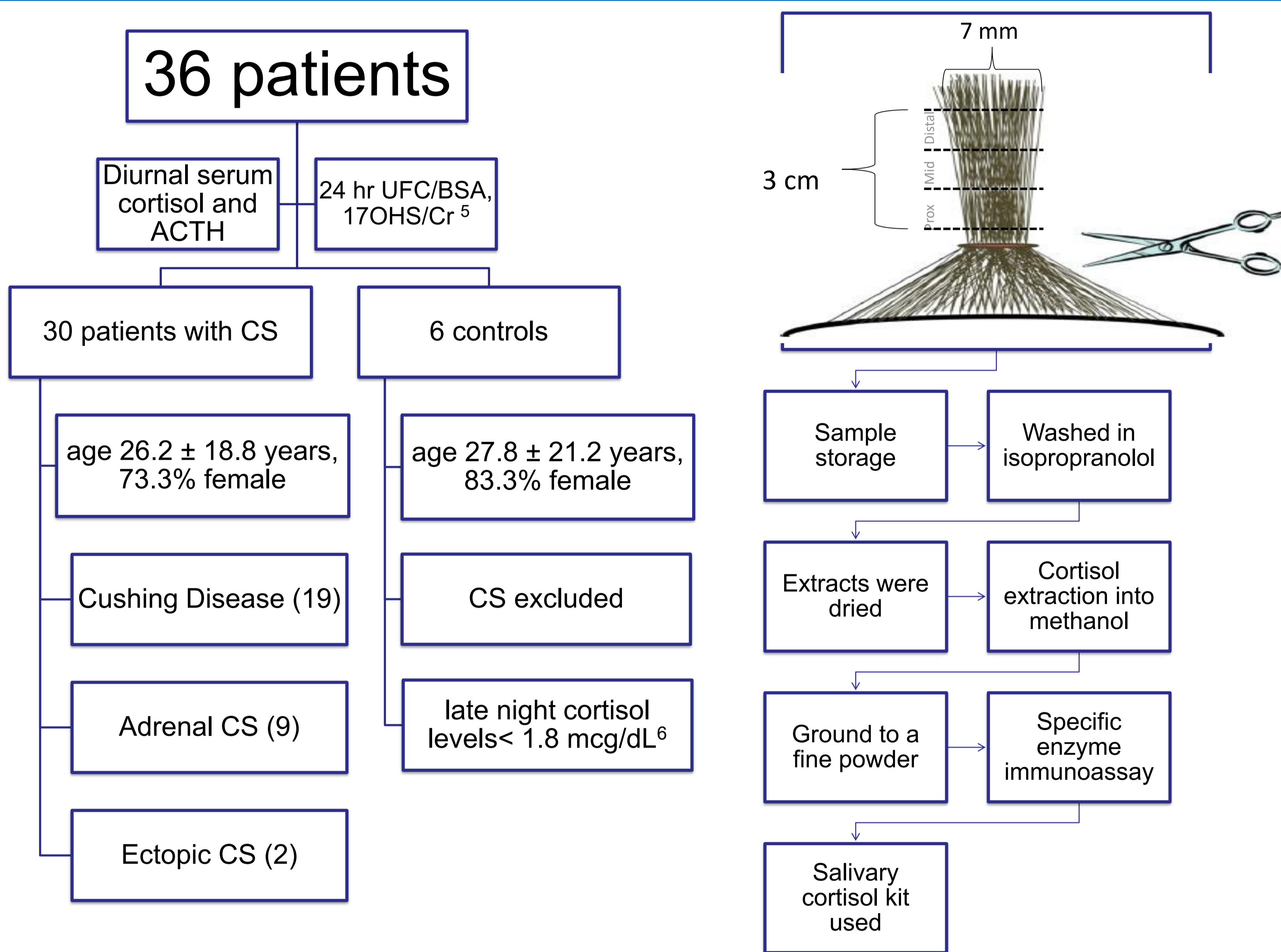
Data analysis: 1. For patients undergoing surgery, all pre-operative biochemical results within the previous 3 months were collected and included in the analysis. 2. Hair cortisol in each 1-cm segment and average over 3 cm were determined 3. To determine any relationships of statistical significance, hair cortisol levels were log transformed for normality, and Pearson's correlations, Student's t-test, and non-parametric testing were used as needed.

Figures A-B. Potential factors that may affect hair cortisol measurement in patients with Cushing Syndrome. (A) Shampoo, hair dyeing, and UV light may diminish hair cortisol levels. (B) Conversion of systemic cortisone to cortisol by keratinocytes (K) and dermal fibroblasts (D).

RESULTS

Proximal hair cortisol was higher in CS patients (96.6±267.7 pg/mg) than control patients (14.1±9.2 pg/mg) (p=0.003). Proximal hair cortisol was highest of all segments in 25/36 (69%) patients. Proximal hair cortisol was strongly correlated with UFC/BSA (r=0.5, p=0.005, Figure 1), late night serum cortisol (r=0.4, p=0.03, Figure 2) and 17OHS/Cr (r=0.3, p=0.06, Figure 3) among all subjects.
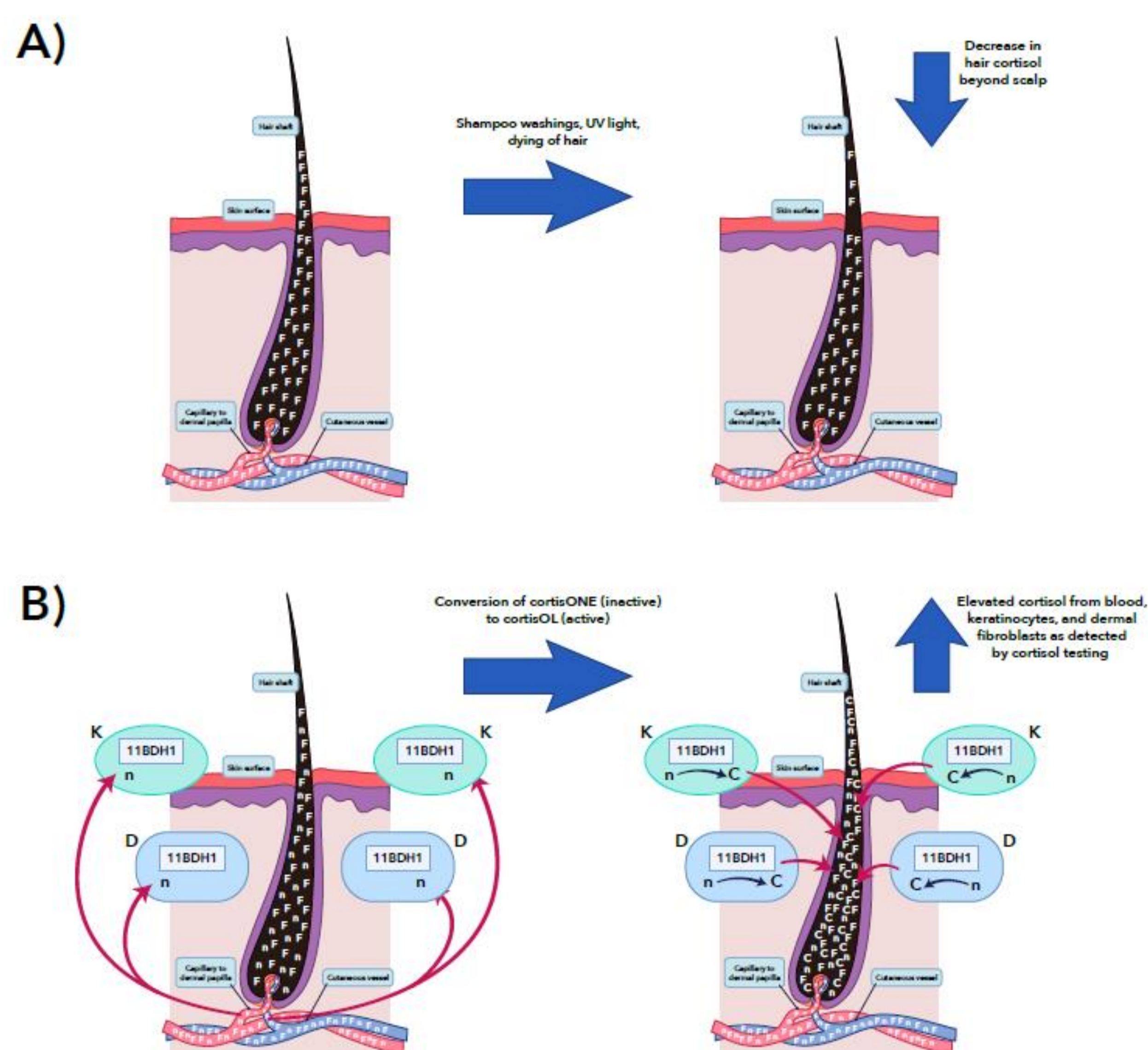

Figures 1-3. Correlations between proximal hair cortisol and BSA/UFC (A), 17OHS/Cr (B), and late night cortisol (C) for all subjects (n=36).

CONCLUSIONS

Proximal hair cortisol levels were the most reliable segment and correlated best of all 3 segments with the majority of the initial biochemical tests for CS in our study. These findings support using proximal hair cortisol in the diagnostic workup for CS.

References

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