CENTRAL PRECOCIOUS PUBERTY AND SLEEP PATTERNS IN COVID-19 OUTBREAK

G.R., UMANO[1],I, MADDALUNO[1], F., LANZARO[1], S.RICCIO[1], R. ANTIGNANI[2], M., GIULIANO[2], C., LUONOGO[1] , A., FESTA[1], E., MIRAGLIA DEL GIUDICE[1], A., GRANDONE[1]

1. Department of the Woman, the Child, of General and Specialized Surgery, University of Campania "L. Vanvitelli", Naples, Italy
2. Società Italiana Medici Pediatri Campania (SIMPe), Italy

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INTRODUCTION

In January 2020, a new severe acute respiratory syndrome due to a previously unknown coronavirus infection was firstly reported in China. Since then, the diffusion of the infection has reached pandemic proportion. With the aim of containing the spread of COVID-19, several Governments have imposed restrictive policies promoting social isolation and "stay at home" leading to sudden and radical changes in social interactions and in study and working conditions. Moreover, Increased incidence of central precocious puberty (CPP) after coronavirus infectious disease-19 lockdown has been reported.

AIM

Our study aims were:

1- to evaluate the changes in precocious puberty rates during lockdown in our tertiary centre of paediatric endocrinology in South Italy;

2- to investigate the differences in sleep habits and disturbances in girls with central precocious puberty compared to healthy controls.

METHOD

- Subjects: girls attending our pediatric endocrinologic clinic because of PPC from April 2020 to April 2021 as cases and matched prepubertal healthy girls as control group
- CPP diagnosis: breast development before 8 years of age and by pubertal basal luteinizing hormone (LH) levels (LH>0.3 UI/L) and/or GnRH-stimulated LH levels >5 IU/L.
- Sleep habits: parents responded to SDSC (sleep disturbance scale for children) questionnaire about sleep habits before and after lockdown, bedtime shift, and smartphone use
- Statistics: Student t-test, Mann-Whitney U test, Fisher exact test and Chi square test were performed as appropriate. CPP incidence was calculated as the ratio of CPP diagnosis and number of outpatients visits a year

RESULTS

AIM 1: a total of 35 girls attenden the clinic during the last year. Retrospective survey revealed that during the previous three years we observed 34 girls with CPP (average of 11 case/year). CPP incidence rate was 2.5-fold higher in 2020-2021 (5:100) compared to 2017-2020 (2:100, p=0.002). CPP after/during lockdown had significant higher levels of LH, FSH, and 17-beta estradiol compared to those diagnosed before (Table 1).

AIM 2: CPP (35 girls) and control group (37 girls) did not differ for age, Z-score BMI, overweight and obesity prevalence, and SDSC scores before lockdown. During lockdown, CPP had significantly higher scores for SDSC total score, DES, SBD, and SWTD subscales (Figure 1). With regards to bedtime, CPP group showed significant higher rates in shifting toward later bedtime during lockdown compared to controls (40.3%, vs 17.7%, p=0.03). No differences were observed in total sleep time and smartphone exposure around bedtime between groups.

	CPP before lockdown (N=14)	CPP during lockdown (N=35)	P
Age (ys)	7.97 ± 1.11	7.59 ± 0.67	0.10
Height (cm)	129.25 ± 6.99	129.69 ± 5.87	0.66
DS-Height	0.17 ± 1.04	0.78 ± 1.0	0.05
Z-score BMI	0.60 ± 0.66	0.23 ± 1.51	0.31
Bone age (ys)	9.33 ± 1.12	8.77 ± 0.67	0.19
LH (UI/ml)	0.87 ± 0.79	1.23 ± 1.12	0.08
FSH (UI/ml)	4.34 ± 2.43	7.09 ± 2.47	**0.02**
17-beta estradiol (pg/ml)	19.38 ± 14.23	30.88 ± 22.53	0.046
Positive familial history (%)	21.4	46.4	0.18

Table 1. Clinical and biochemical characteristics of CPP cases diagnosed before and after lockdown measures.

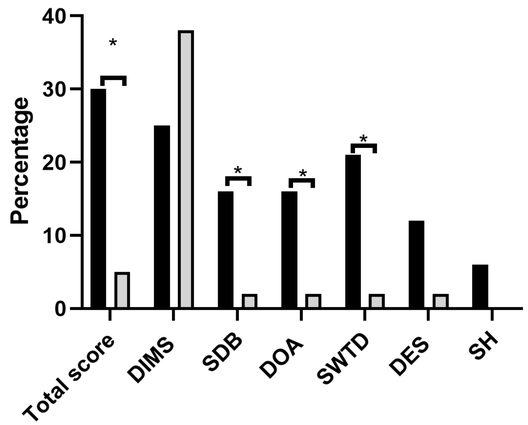

Figure 1. Distribution of pathologic scores according to groups. Star indicates significant differences. Black bars refer to CPP group, grey bars to control group. Legend: DIMS: disorders of initiating and maintaining sleep; SBD: sleep breathing disorders; DOA: disorders of arousal; SWTD: sleep wake transition disorders; DES: disorders of excessive somnolence; SH: sleep hyperhidrosis.

CONCLUSIONS

Our study supports the observation of increased incidence of CPP after lockdown. Home confinement has significantly altered daily routine in children and adolescents and indirect health consequence of confinement are arising. In our sample, sleep disturbs are a frequent comorbidity in girls with CPP, and clinicians should be aware of this association. Further pathophysiologic studies are needed to investigate whether sleep alteration might be a trigger for puberty onset.

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CONTACT INFORMATION

Anna Grandone,

Department of the Woman, of the Child, of General and Specialized Surgery, University of Campania Luigi Vanvitelli, Naples, ITALY

Phone: 00390815665426; email: agrandone@gmail.com