

NEUROPSYCHOLOGICAL SEQUELAE IN KLEINE-LEVIN SYNDROME

CASE REPORT

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ABSTRACT - Kleine-Levin syndrome is characterized by periodic hypersomnia, hyperphagia, sexual disinhibitions and behavioral disturbances. The prognosis is generally benign, with normal cognitive and social functions after the episodes. We describe a typical case of Kleine-Levin syndrome associated with apparent academic decline, neuropsychological sequelae and personality alterations after the second episode of the illness. Further research in the natural history of Kleine-Levin syndrome is needed, for example, to determine whether early intervention would improve long-term prognosis.

KEY WORDS: Kleine-Levin syndrome, neuropsychology, sequelae.

Sequela neuropsicológica na síndrome de Kleine-Levin: relato de caso

RESUMO - A síndrome de Kleine-Levin é caracterizada por hipersônia periódica, hiperfagia, desinibição sexual e outras alterações do comportamento. O prognóstico é geralmente benigno, com funções cognitivas e sociais normais após os episódios. Descrevemos um caso típico de síndrome de Kleine-Levin associada com declínio acadêmico, sequela neuropsicológica e alterações da personalidade após o segundo episódio da síndrome. Estudos adicionais sobre a história natural da doença são necessários para, por exemplo, determinar se a intervenção terapêutica precoce melhoraria o prognóstico a longo prazo.

PALAVRAS-CHAVE: síndrome de Kleine-Levin, neuropsicologia, sequela.

Kleine¹, in 1925, reported a series of cases of periodic somnolence. Almost a decade later, Levin² described morbid hunger associated with periodic somnolence, now known as Kleine-Levin syndrome. The syndrome classically occurs in an adolescent male and consists of recurring episodes of hypersomnia, hyperphagia and sexual disinhibitions³. The syndrome is known to be generally benign with normal physical and mental health between attacks⁴. We report the case of a patient with classical features of Kleine-Levin syndrome who displayed neuropsychological sequelae and declined academic performance after his second episode of illness.

CASE

A 14-year old right-handed white medium class Junior High student, attended the Psychiatric Emergency with a one week history of increased sleep, voracious hunger (only when food was available to him) and sexual disinhibitions (public masturbation). He was sleeping continuously for about 13 hours a day. While awake, the

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Table 1. Neuropsychological assessment.

Tests	Normal range*	Results	Conclusions
Digit Span forward and backwards (WISC-III)	11-15	8	Below average verbal span.
Coding B (WISC-III).	50-65	46	Impairment of visuo-motor dexterity**
Arithmetic (WISC-III).	13-15	13	Normal calculation.
Picture Memory (WRAML)	18-26	21	Normal visual memory for details.
Design Memory (WRAML)	31-40	29	Impairment of visual memory for designs***
Finger Windows (WRAML)	15-19	15	Normal visual span.
Verbal Learning (WRAML)	30-40	38	Normal verbal learning trough repetition.
Story Memory (WRAML)	23-32	14	Impaired memory for verbal material.

WISC III, Wechsler Intelligence Scale for Children, 3rd edition; WRAML, Wide Range Assessment of Memory and Learning; *raw scores based on a Brazilian normative sample; **this subtest may be impaired on a wide range of brain injuries, independent of their localization; ***the impairment is in the mild range, not clinically significant.

patient was withdrawn, aggressive with his peers, and said to be hearing "Jesus and two women" saying that he was going to be nice. On mental status examination he was lethargic but fully arousable, inattentive, disorientated to time and restless. He displayed concrete thinking and was quite unconcerned about the reasons for his consultation. He was not elated or clearly delusional and did not complain of visual or auditory hallucinations. He stared at the nurses body in indiscreet way during the interview. To better evaluate the patient, we decided not to give him medications. He had a normal physical examination. Neurological examination was normal, with the exception of the state of consciousness. All blood tests ordered (hemogram, blood sugar, urea, creatinine, electrolytes and liver enzymes), cerebrospinal fluid and CT head scan were normal.

The day after the presenting consultation, the mother said the patient "woke up", with the improvement of most of his symptoms. He had no memories of this episode. He re-started school and his social life but, in his mother's words, "He was not normal, but childish and playing with younger children". His aunt and peers corroborated this behavior. This kind of behavior was present until the last consultation, four months later. An EEG recorded at rest with closed eyelids 1 month after this episode, was characterized by high amplitude, preferentially in the alpha band (from 9.5 to 10.2 Hz) mainly in occipital regions, especially in the right side compared with the left. EEG reactivity (attenuation of alpha band) occurred with bilateral opening of the eyes. Hyperventilation did not modify resting EEG. The EEG was considered normal for his age. As his academic performance worsened considerably, we requested a neuropsychological assessment (Table 1), performed one month after the resolution of this episode. He displayed below average auditory-verbal span and memory for verbal material. These results were suggestive of lateralized deficits in the dominant hemisphere.

Past psychiatric history: Two weeks before the presenting episode, he had had similar symptoms (hypersomnia, hyperphagia and public masturbation), which lasted one week and were precipitated by a febrile illness. After this first episode, the symptoms have subsided. He reported no memories of this period but a feeling of have slept "a thousand years". He was not seen by doctors at that time and resumed his studies and his normal social life for a week, with apparently no problems until the present episode.

Developmental history: His mother had a normal pregnancy and he had a normal delivery. There was no apparent developmental delay. At school, he was considered an excellent student and very popular among his peers.

Familial and medical history: he has both parents alive and healthy, but has an maternal aunt with schizophrenia. He has one healthy brother. He has no history of headache, seizures, head trauma, loss of

consciousness and episodes of disorientation and confusion, but was “nervous” and had temper tantrums in his middle childhood. There is no history of sleep disorders, hypertension, diabetes, sexually transmitted diseases, tuberculosis, surgery and blood transfusions.

DISCUSSION

In 1962, Critchley⁵ reviewed 26 cases recorded up to that time and characterized the syndrome. Kleine-Levin syndrome predominantly affects male adolescents and has the following symptoms: compulsive eating rather than excessive appetite (latter called *megaphagia*), behavioral abnormalities, sleep disorder, and spontaneous remission. Also, a history of antecedent infection or febrile illness is frequently present. The diagnosis is purely clinical. There may be moderate diffuse abnormalities and abnormalities in stage REM at sleep onset during attacks (diurnal EEGs) with return to normality with clinical improvement^{5,6}. The pathophysiology is currently unknown but there is considerable agreement that it may involve the hypothalamus, according to neuropathological⁷⁻⁹ and endocrinological studies^{3,10,11}. An abnormal cortisol rhythm was suggested as a predisposition factor¹². The frontal lobe may also be implicated in the pathophysiology of the syndrome^{2,13}. Orlosky¹⁴ reviewed the manifestations and diagnosis of the disorder, with particular attention to psychiatric symptoms as described in 33 well-documented cases reported in the literature. Irritability was present in 58% of cases; partial or complete retrograde amnesia for the duration of attack in 39%, lethargy in 24%, sexual disinhibitions in 18%, and auditory hallucinations in 12%. According to the Orlosky review, our case can be considered, at least cross-sectionally, typical. Kleine-Levin syndrome is known to be generally benign with normal physical and mental health between attacks⁴, but the interepisodic functioning of most patients has not been evaluated in sufficient detail to detect evidence of subtle brain dysfunction¹⁵.

Persistence of minor behavioral mal adjustments after an episode has been attributed to concern about recurring attacks¹². According to George¹⁶, social difficulties and lack of confidence can be the result of the disorder. Alternatively, it is possible that the earlier reports of patients showing mal adjusted behavior between episodes have overlooked the cognitive deficits giving rise to such mal adjustment¹⁵. Sagar et al.¹⁵ described three patients with low average (patient A) to borderline (patient B and C) levels of intellectual functioning on the WAIS, as well as low memory quotients. Two patients (patient A and C) tended to have lateralized deficits in non-dominant hemisphere. Two patients (patient A and B) became insolent and quarrelsome between episodes and the author suggested that it could be considered a reaction to the difficulties in coping with the new of intellectual deficits. Even though intelligence was not formally tested before the illness, the fact that all of them, including our patient, had above average academic performance before the illness makes it likely that the intellectual functioning declined after the illness started. In the article by Sagar et al.¹⁵, there was no reference to the number of episodes each patient displayed and when the neuropsychological tests were performed.

In our patient, the findings of academic decline and auditory-verbal attention and memory deficits suggest lateralized brain dysfunction in the dominant hemisphere. It is also possible that the personality alterations observed in the present patient is related to persistent brain dysfunction after Kleine-Levin syndrome. Based on the present report and on the reports of Sagar *et al*¹⁵, neuropsychological deficits, when lateralized, can involve either hemisphere. As the academic decline was noted after the second episode, it is possible that intellectual decline deficits tend to be cumulative and increase in proportion to the number of episodes. The later assumption is clinically relevant. Research is needed to determine whether early treatment during and after a episode would improve prognosis or prevent cognitive decline. Prevention of subsequent episodes is said to be achieved with lithium¹⁷, valproate¹⁸, carbamazepine¹⁹ or antidepressants, as moclobemide²⁰ and tricyclics²¹.

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