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Efficiency of CPAP Therapy in the Treatment of Sleep Apnea Syndrome in Patients with Grade III-IV Obesity

Abdiev Kattabek Makhmatovich[1], Keldiyarov Tokhir Bakhtiyarovich[2], Gafarov Fazliddin Ergashevich[3]
[1]*Docent of the Department of Hematology, Samarkand Medical Institute*
[2, 3]*Samarkand multidisciplinary medical center, Therapist*

Abstract: ***Obstructive sleep apnea syndrome (OSAS) and obesity are multifactorial and mutually aggravating diseases. Weight loss appears to be quite effective in controlling sleep disturbances, but the effect of OSAS treatment on body weight dynamics in obese patients remains poorly understood. A feature of the presented clinical case is a clinically significant decrease in body weight in a patient with morbid obesity complicated by severe obstructive sleep apnea syndrome using a standard approach to obesity therapy. Weight loss in this case was achieved due to the patient's high adherence to therapy and the absence of concomitant mental disorders. The high cost of CPAP therapy devices, their constant use during night sleep and the need for titration of therapeutic pressure make this therapy inaccessible. In this connection, in the complex treatment of obesity in patients with breathing disorders during sleep, in the absence of the possibility of CPAP therapy, individual therapeutic training should be provided to increase their medical motivation and compliance, more frequent visits to the endocrinologist, as well as correction of concomitant psychopathological disorders to achieve effective and long-term therapeutic success.***
Key words: obesity, obstructive sleep apnea syndrome, CPAP therapy, compliance.

I. INTRODUCTION

Treatment of obese patients complicated by obstructive sleep apnea syndrome (OSAS) is a difficult task, since OSAS and obesity are heterogeneous and mutually aggravating conditions [2]. Currently, the method of choice in the treatment of OSAS, in addition to weight correction, is continuous positive airway pressure therapy through a nasal mask during sleep (CPAP therapy). Data on the effect of restoring sleep structure on weight dynamics are ambiguous. According to some authors, against the background of complex treatment of obesity, including regular CPAP therapy, there was a clinically significant decrease in body weight in most obese patients [1, 6, 9]. According to other studies, the addition of CPAP therapy to a comprehensive weight loss program did not lead to clinically significant weight loss [8, 15] or was accompanied by an increase in body weight [11].

II. MAIN PART

We present a description of a clinical case of an obese patient complicated by severe obstructive sleep apnea syndrome. Patient K., born in 1988, came to the Department of Therapy and Prevention of Endocrinopathy of the LDO of the Federal State Budgetary Institution "Endocrinological Research Center" with complaints of overweight and loud snoring. From the anamnesis it is known that the patient grew and developed in accordance with age, has no chronic diseases. Heredity is burdened by obesity. Overweight from early childhood, intensive weight gain from the age of 8, during the last year +10 kg. No attempts were made to reduce body weight. The patient was examined and treated according to the algorithm of recommendations of the Russian Association of Endocrinologists for the diagnosis and treatment of obesity in adults (2010) [4]. Upon admission to the department, the general condition is satisfactory, hypersthenic build, height 175 cm, body weight 153 kg, waist circumference - 149 cm, neck circumference - 47 cm, BMI - 50 kg/m2. The skin is of normal color, high humidity, no stretch marks. Male pattern hair. The heart sounds are clear, the rhythm is correct, there are no murmurs. BP 140/100 mmHg Art., heart rate 80 beats. in min. Breathing is vesicular, it is carried out in all parts of the lungs, there are no wheezing. The abdomen is soft and painless on palpation. The thyroid gland is not enlarged on palpation, soft-elastic consistency, painless, there are no clinical signs of dysfunction. When evaluating the self-control diary, the patient had regular meals (3-4 main meals), the highest calorie content of the daily diet was in the second half of the day, including night food (juices, fruits), an excess of the daily calorie content of the diet by 30 -40% due to large portions, excessive consumption of fats (40-50% of the daily diet) and high-calorie foods.

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According to the results of the DEBQ questionnaire and the three-factor questionnaire of Stunkard, an eating disorder of the external type was noted. The patient led a sedentary lifestyle, practically excluding any physical activity.

For the purpose of subjective assessment of sleep, an original extended study protocol was used, which included domestic and international questionnaires. The patient's questionnaire data showed normal indicators of the subjective assessment of sleep quality, a high risk of sleep apnea, severe daytime sleepiness, normal indicators of anxiety and depression according to the "Hospital Anxiety and Depression Scale". Studies of biochemical parameters were carried out in the biochemical laboratory of the Federal State Budgetary Institution ENEC (head of laboratory, Doctor of Medical Sciences A.V. Ilyin). Hormonal studies were carried out in the hormonal laboratory of the Federal State Budgetary Institution ERC (head of laboratory, Prof. Dr. med. N.P. Goncharov). According to the results of the clinical and laboratory examination, the patient was diagnosed with metabolic syndrome according to the IDF 2005 criteria. Due to low levels of testosterone and luteinizing hormone (LH), the patient was consulted by an andrologist. For the purpose of differential diagnosis of hypogonadism, a test with clomiphene was performed, the results of which showed an increase in testosterone and LH to standard values. Thus, the patient was diagnosed with androgen deficiency against the background of obesity, weight loss was recommended. Due to the difficulty of acoustic access during ultrasound examination of the abdominal organs, the patient underwent multislice computed tomography, which showed signs of hepatomegaly, fatty hepatosis. The results of the laboratory examination of the patient before treatment are presented in Table 1. To objectify the sleep picture, a night polysomnographic study was performed using the Grass Technologies hardware-software complex (USA), with the results evaluated according to the criteria of A. Rechtschaffen, A. Kales, 1968 [10]. According to the results of the study, the presence of severe obstructive sleep apnea syndrome with a respiratory distress index (RDI) of 74.3 episodes/hour was confirmed, with a norm of up to 5 episodes/hour (Fig. 1). During a trial treatment with a constant positive air pressure (CPAP) ventilation device through a nasal mask, there was an improvement in sleep and breathing during sleep to standard values. Thus, on the basis of clinical and laboratory examination data for the endocrine genesis of obesity in the patient was not received, the diagnosis was made: Morbid obesity. Severe obstructive sleep apnea syndrome. Non-alcoholic fatty liver disease. Androgen deficiency on the background of obesity.

Due to the presence of an eating disorder, the patient was consulted by a psychiatrist. According to the results of the clinical psychopathological method of examination of mental disorders, no psychiatric disorders were identified. Mental status upon admission to the clinic: the contact is well accessible, answers questions to the point, without delay, the voice is modulated and emotionally colored, the facial expression is interested, the mood is slightly elevated. The patient talks openly and in detail about the events of his life, has difficulty describing emotions, describes himself as “responsible, thorough, loving order”, dreams of starting a family, thinks that losing weight will help him meet a girl. The patient admits that he overeats in the evening, associates overeating with the opportunity to relax and get additional pleasure. According to the results of psychodiagnostic testing using the "Methodology of Multilateral Personality Research" (MMIL), there is a tendency to high activity, increased mood background, sociability and high self-esteem (the tendency to increase the profile of MMIL on the 9th scale). In addition, there is a tendency to shift gender-role behavior towards the opposite sex, manifested by the predominance of increased sensitivity in behavior, lack of independence, emotiveness, in the direction of interests in the sphere of interpersonal relations (a tendency to increase the MMIL profile on the 5th scale). The patient's personality is characterized by hyperthymic, anancaste features that reach the level of accentuation, the behavior is characterized by high motivation and compliance for weight loss.

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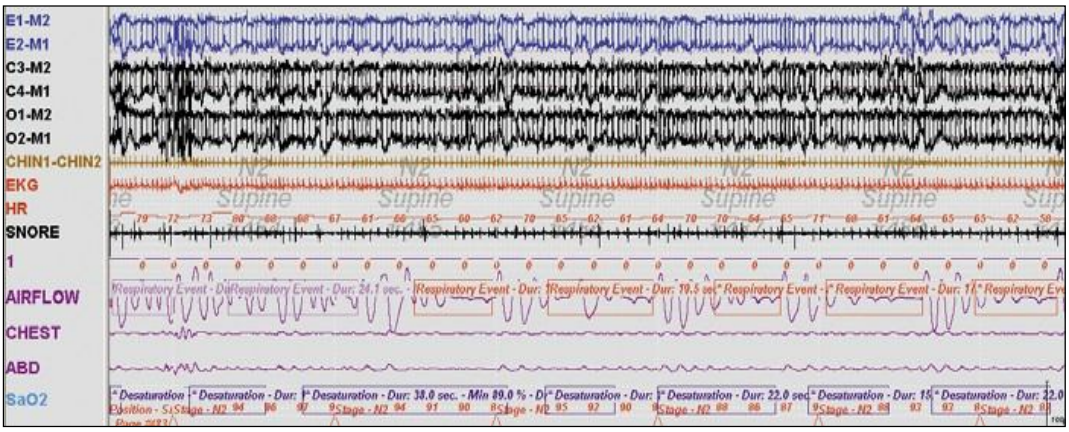


Figure1 A fragment of a polysomnographic study of patient K. before obesity treatment (body weight 153 kg, BMI 49.9 kg/m2). The structure of sleep is changed due to an increase in the time of wakefulness and the number of awakenings during sleep, the absence of phases of deep sleep and REM sleep (intrasomnicheskoe disorder). During sleep, multiple episodes of sleep disturbances were recorded with an index of respiratory disorders (RDI) of 74.3 episodes/hour (at a rate of up to 5 episodes/hour), presented as obstructive sleep apnea (highlighted in red) and hypopnea (highlighted in pink). color), respiratory disorders were accompanied by episodes of a drop in the level of blood oxygen saturation - desaturations (highlighted in blue), desaturation index (ID) - 41.1 episodes/hour; 24.5% of total sleep time was spent with saturation less than 90%, while the average level of saturation was 92.6%, the minimum - 78%.

The hospital provided personalized training for the patient on the principles of nutrition and self-control, and developed an individual weight loss program, taking into account the existing metabolic complications. Taking into account the peculiarities of the patient's nutrition and eating behavior, the absence of mental disorders, the presence of concomitant arterial hypertension, and the need for long-term treatment of obesity, the peripheral drug orlistat (Xenical) was prescribed as drug therapy. Thus, the patient is advised: 1. hypocaloric nutrition of 1600–1800 kcal with restriction of fats to 50 g/day and foods rich in purine bases; 2.regular physical aerobic and moderate power loads for 45–60 minutes a day; 3. drug therapy (xenical 120 mg x 3 times a day) for at least 12 months; 4. Carrying out regular CPAP therapy through a special mask during night sleep in order to correct respiratory disorders; 5.monthly monitoring.

A feature of the presented clinical case is a clinically significant decrease in body weight in a patient with morbid obesity, complicated by severe obstructive sleep apnea syndrome, when using complex personalized treatment of obesity, taking into account age, type of eating behavior, and physical capabilities. In this case, careful medical monitoring for 1.5 years, high compliance of the patient, in the absence of concomitant mental disorders, made it possible to reduce body weight by 46 kg, achieve normalization of breathing during sleep, sleep structure and gonadotropic function, which together contributed to a steady improvement in metabolic parameters, maintaining weight at an optimal level and improving the quality of life.

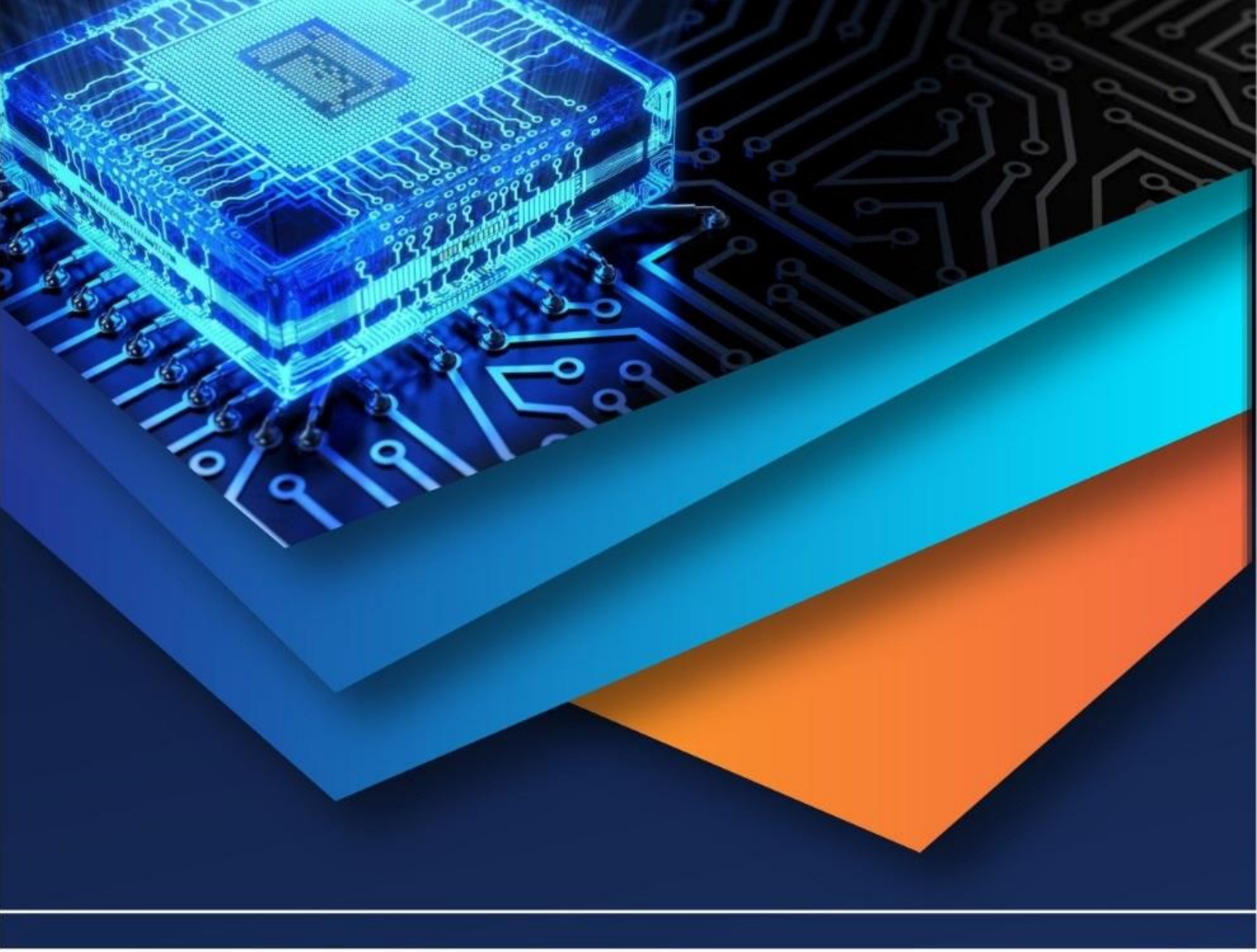
III. CONCLUSION

The high cost of CPAP therapy devices, their constant use during night sleep and the need for titration of therapeutic pressure make this therapy inaccessible. In this connection, in the treatment of obesity in patients with breathing disorders during sleep, in the absence of the possibility of CPAP therapy, individual therapeutic training should be provided to increase their medical motivation and compliance, long-term drug therapy, more frequent visits to the endocrinologist, as well as correction of concomitant psychopathological disorders to achieve effective and long-term therapeutic success.

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