**Chronic Partial Sleep Deprivation in Adult Subjects Residing in Navi Mumbai – A Pilot Study**

ABSTRACT-

Sleep research has rapidly expanded and evolved in the past few decades. Sleep is central to a healthy childhood, and sleep-disordered breathing (SDB)—the disruption of normal respiratory patterns and ventilation during sleep. Affected children and adults are at risk for wide-ranging direct health consequences like hypertension, cardiovascular disease, metabolic disorders, obesity, and neuropsychiatric and developmental issues. Thus, early detection and interdisciplinary approach is necessary to enhance quality of life. **Aim:** This study was aimed to assess prevalence of adults residing in Navi-Mumbai facing chronic sleep deprivation through subjective sleep times and wake times. **Methodology:** A prospective study conducted among 220 in the age group of 20 – 30 years was randomly selected residing in Navi- Mumbai. Questionnaire survey was conducted and responses were noted respectively. **Results:** 82% of response rate was obtained. It was observed that (42%) of subjects reported nocturnal sleep duration less than 7 hours indicated the chronic partial sleep deprivation. It was also observed that (23.4%) of subjects reported nocturnal sleep duration of more than 7 hours indicating hypersomnia. **Conclusion**: This study found nocturnal sleep deprivation has definite negative impact on the quality of life of both parents and children. **Clinical Significance:** Society at large needs to be educated about sleep hygiene to prevent several disorders.

KEYWORDS- Sleep deprivation, sleep disordered breathing, obstructive sleep apnea, quality of life.

INTRODUCTION-

Sleep is essential for physical, mental and emotional well-being. Modern life-style- late night working and early awakening has disturbed the sleep cycle. Chronic partial sleep deprivation is common in modern lifestyle.

Sleep is a dynamic process that involves multiple stages, each with distinct brain wave patterns, physiological responses, and restorative functions. A sleep cycle typically lasts around 90-120minutes, with each cycle consisting of three stages of non-rapid eye movement sleep (NREM), and one stage of rapid-eye movement (REM) sleep. Sleep disordered breathing (SDB) is the condition defined as cessation of airflow leading to poor sleep cycle. Altering sleep cycles can act as a potentially life threatening condition that has been well documented in the medical literature. Dentists have become actively involved with managing SDB patients with oral devices.

In non-sleep disorder patients, as the diaphragm attempts to pull air through the upper airway during inspiration, a negative pressure is created due to airflow resistance caused by the airway walls. As the pressure reduction occurs, there is a resulting decrease in the airway’s shape, which is normally retained by activity of the tensor veli palatine and genioglossus muscles. For SDB patients, the upper airway is often completely compromised—resulting in a reduction of oxygen reaching the lungs and vascular system. This compromise may be due to any condition that causes impingement on the airway. An incomplete blockage may cause the oral soft tissues such as the uvula to vibrate, resulting in the sound of snoring. Complete obstruction results in OSA.

Understanding sleep cycle is essential for appreciating the complexities of sleep and its impact on overall health and well-being. OSA subjects shows higher prevalence of: (1) difficulty in breathing; (2) observed apneas; (3) restless sleep; (4) parasomnias; and (5) nocturnal enuresis. Sleep disorders may be manifested by multiple symptoms in young children and infants and may cause severe medical, behavioral, and and/or sociological problems. Thus, our focus is to spread awareness about importance of quality and duration of sleep cycle on one’s healthy life.

METHODOLOGY

A self-designed questionnaire with nine questions about their sleep conditions were framed including sleep times, wake times, snoring, refreshed and unrefreshed sleep. Enquiry was also made regarding any existing cardio-metabolic disorders like hypertension, diabetes mellitus, etc. Three rating response options were based on the Likert scale to indicate sleep cycle in the participants. Seven hours sleep was considered as normal. Score 0 = never; 1 = sometimes; 2 = often.

Steps were taken to ensure the reliability of the language translation. All the participants were asked to complete the questionnaire under our supervision, and inter-personal communication was not allowed. The duly filled-out questionnaire was collected from the participants on the same day after 10 minutes. Any query on the questionnaire was clarified by the investigator, and the answers were collected and subjected to statistical analysis. Advice and comments to participant’s about their sleep were given only after they had answered the questionnaire, in order not to influence their responses.

**STATISTICAL ANALYSIS:**

Statistical Package for Social Sciences [SPSS] for Windows Version 22.0 Released 2013. Armonk, NY: IBM Corp., will be used to perform statistical analyses. **Descriptive Statistics:**
Descriptive analysis of all the explanatory and outcome parameters will be done using frequency and proportions for categorical variables, whereas in Mean & SD for continuous variables.  **Inferential Statistics:**

Mann Whitney Test was used to compare the mean Participants' duration of sleep.

The level of significance was set at P<0.05.

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RESULTS-

The duration of sleep was found to be in range of 3 hours to 9 hours, with the following

**Table No.1- Total duration of nocturnal sleep observed in subjects.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Duration of sleep in hours** | **No. of subjective** | **Percentage (%)** |
| 1 | 3  | 2 | 0.975% |
| 2 | 4 | 15 | 2.44% |
| 3 | 5 | 19 | 9.27% |
| 4 | 5.5 | 9 | 4.39% |
| 5 | 6 | 42 | 20.48% |
| 6 | 6.5 | 9 | 4.39% |
| 7 | 7 | 71 | 34.63% |
| 8 | 7.5 | 9 | 4.395 |
| 9 | 8 | 33 | 16.09% |
| 10 | 9 | 6 | 2.92% |

**Table No.2- Subjects responding less than 7 hours of nocturnal sleep.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Duration of sleep in hours** | **No. of subjective** | **Percentage (%)** |
| 1 | 3 | 2  | 0.975% |
| 2 | 4 | 15 | 2.44% |
| 3 | 5 | 19 | 9.27% |
| 4 | 5.5 | 9 | 4.39% |
| 5 | 6 | 42 | 20.48% |
| 6 | 6.5 | 9 | 4.39% |

Total percentage of subjects responding less than 7 hours is 42%

**Table No.3- Subjects responding more than 7 hours of nocturnal sleep.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Duration of sleep in hours** | **No. of subjective** | **Percentage (%)** |
| 1 | 7.5 | 9 | 4.39% |
| 2 | 8 | 33 | 16.09% |
| 3 | 9 | 6 | 2.92% |

Total percentage of subjects responding more than 7 hours is 23.4%

It was observed that 86 (42%) of subjects reported nocturnal sleep duration less than 7 hours indicated the chronic partial sleep deprivation. (TABLE NO. 2)

It was also observed that 48 (23.4%) of subjects reported nocturnal sleep duration of more than 7 hours indicating hypersomnia. (TABLE NO. 3)

 DISCUSSION-

With technological advances, remaining ‘connected’ has become part of our lives. Remaining alert and attentive increases productivity, but what is being sacrificed in the end? It is good that there is increasing interest in sleep and sleep disorders, since inattention and insufficient sleep have become the norm in our society, rather than aberrancies. Of the exisiting sleep disorders, Obstructive sleep apnea is a common disorder that affects one of four men and one of 11 women in the world. With the onset of menopause women experience a higher OSA prevalence than before menopause. Craniofacial features may contribute to higher prevalence rates amongst the minority groups of African-American people.

OSA is a combination of anatomical and neurological control abnormalities that occur during sleep can combine to consistently restrict, or even completely prevent gas flow into the lungs. Upper respiratory airway plays and vital role in OSA. Deviated nasal septum, hypertrophy of mucosa, micrognathia/retrognathia, macroglossia, tonsillitis etc. appears to play role. Obesity has long been recognized as a risk factor for sleep apnea.

There is a compelling and complex connection between sleep, mood and behavior. The literature demonstrating the negative effects of sleep abnormalities on functioning has developed rapidly over the past few decades. The daytime consequence includes sleepiness, mood problems, cognitive problems, and functional impairments. Certain serious physical health problems like hypertension, increased risk of heart disease and increased risk of stroke can be seen. Cognitive dysfunctioning includes poor performance at school/workplace, poor memory and concentration that can lead to lack of self-confidence and depressive symptoms.

Our research has shown that people with disturbed mindset, heavy workload, continuous competitive surrounding is facing chronic partial sleep deprivation. Chronic partial sleep deprivation (CSPD) was observed in 42% of subjects (TABLE NO.2) .Chronic partial sleep deprivation is a known risk for daytime sleepiness, tiredness and cardio metabolism i.e hypertension and insulin resistance. We also observed that 23.4% of subjects (TABLE NO. 3) had duration of sleep of more than 7 hours .This may be due to several factors like intrinsic sleep disorder i.e. obstructive sleep apnea. Excessive sleepiness may affect the activities along day time e.g. accidents while driving. We also observed that 4.87% had disease i.e. Juvenile diabetes, Hypertension, and Asthma. All these disorders are related to quality and quantity of sleep.

CPSD/ OSA can be treated by simply modifying your routine lifestyle and dietary habits. Certain equipment’s like Auto-CPAP, Bi-level CPAP etc. while, surgical treatments such as maxillary expansion, mandibular osteogenesis, tracheostomy, etc. can be done. It is essential for a physician to understand and take appropriate decision while people undergoing the condition to modify their daily lifestyle in order to avoid such complications. As it is rightly said, ‘health is priceless’ but underestimating it can make life miserable.

CONCLUSION-

It can be concluded that the deficiency in sleep of the young children and young adults have significantly affected their quality of life. In order to prevent a subsequent detrimental effect on children's and adults quality of life, it is necessary to facilitate sleep awareness and accordingly services to improve sleep cycle. Moreover, these findings may support future research and clinical endeavors aimed at enhancing quality and duration of sleep on quality of life.

CLINICAL SIGNIFICANCE-

Society at large needs to be educated about sleep hygiene to prevent several disorders.

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