

Editorial

Wake-up call for sleep disorders in developing nations !

Why was there a need for the Indian Journal of Medical Research to publish a special issue on Sleep Medicine? Researchers from developed countries did a remarkable job by conducting and publishing landmark studies over the last several years on sleep related disorders. These studies reported burden of various sleep disorders especially obstructive sleep apnoea (OSA), its pathophysiology, risk factors, consequences and treatment. These studies have immensely contributed towards better understanding, and increased awareness of OSA among practicing physicians and lay public. The scenario is different in the resource-poor nations where there is a lack of awareness of these disorders among physicians as well as public and equally important is scarcity of resources, infrastructure and trained human resource to carry out these studies. While infectious diseases such as malaria, tuberculosis, HIV/AIDS still remain a top priority for these nations, in the coming years the emerging epidemic of obesity including childhood obesity and its consequences will impose dual-burden that will threaten to destabilize the health services of these countries. Obesity, a major risk factor for OSA, is propelled by several factors such as adoption of sedentary lifestyle, availability of easily affordable motorized transport, use of labour-saving mechanical devices, overuse of computers, televisions, easy availability of highly refined oils and carbohydrates and consumption of *ad lib* fast-food items. Further, OSA also contributes to development of increased cardiovascular morbidity and mortality. While data on the association of OSA, metabolic syndrome and several of its components are conflicting, recently published literature does seem to suggest association of OSA and metabolic syndrome independent of confounding covariates especially obesity as defined by body mass index (BMI). These research topics belong to cutting-edge science. With increasing urbanization, sleep disorders

related to shift-work will become more prominent in future while insomnia still remains the most prevalent sleep disorder worldwide. This special issue contains articles from some respected researchers and clinicians from all over the world.

The article¹ by Chokroverty provides basic information about some important laboratory tests and principles of treatment of sleep disorders to the general physicians. The article on Circadian rhythm and sleep disorders (CRSD)² describes The International Classifications of Sleep Disorders-2 which recognizes 6 CRSDs [non-24-h disorder (free-running type), irregular sleep-wake phase disorder, advanced sleep phase disorder, delayed sleep phase disorder, Jet lag and shift-work disorder]. CRSDs may also be secondary to medical conditions and drug or substance abuse and CRSD Not Otherwise Specified (NOS). The review on Central sleep apnoea³ emphasizes a need for more studies on this topic in different population groups especially Asians. The authors describe the prevalence, pathogenesis and potential treatment modalities for central sleep apnoea.

The article on Definition, epidemiology and natural history of obstructive sleep apnoea (OSA) also stresses a need for more epidemiological studies from developing countries⁴. Abnormalities of craniofacial features may be important in Asians. Lack of awareness of OSA among physicians and lay public is emphasized. Limited access to diagnostic and treatment in resource poor setting is discussed. The article on Epidemiology of OSA in India⁵ also emphasizes need for more studies from India; nevertheless, published Indian studies do not indicate significant difference in prevalence and risk factors for OSA. Review on Pathophysiology and genetics of obstructive sleep apnoea provides a comprehensive description of several risk factors for OSA, the authors also review the state-of-the-art

knowledge regarding OSA pathogenesis in adults and highlight the potential role of genetics in influencing key OSA pathophysiological traits⁶. The article on Consequences of OSA⁷ provides description of all consequences including memory deficits, impaired executive function, increased daytime sleepiness, increased proneness to automobile and occupational accidents and decreased quality of life. The chapter emphasizes an improvement in outcome including quality of life in OSA patients with treatment.

The review on Cardiovascular consequences of OSA⁸ suggests that activated nocturnal pathophylogic mechanisms in OSA patients might lead to increased cardiovascular morbidity and mortality. The authors outline evidence of the association between OSA and cardiovascular diseases and provide insights into mechanisms linking OSA to cardiovascular diseases. The article on Sleep and metabolic syndrome⁹ reviews the current knowledge of the relationship between sleep disturbances sleep-disordered breathing and the metabolic syndrome in adults. Sleep is considered to be an essential part of and sleep disturbance is known to be associated with metabolic dysfunction. Sleep deprivation and poor quality sleep contribute to increased cardiovascular risk by their adverse effect on metabolism and hormonal processes. OSA is increasingly being recognized as an independent cardiovascular risk factor. Studies on the association of OSA and metabolic syndrome are being pursued worldwide and the mechanistic links between OSA and metabolic syndrome are being worked out. The review on Diagnosis of sleep apnoea focuses on the use of clinical prediction rules, measurement and implications of the apnoea-hypopnoea index, controversy about the use of portable monitors, distinguishing central from the obstructive sleep apnoea and significance of associated periodic limb movements¹⁰. The article on Evaluation of the upper airway in OSA¹¹ focuses on the utility of individual upper airway evaluation tools including clinical examination and use of various imaging modalities including conventional and electron beam computed tomography, magnetic resonance imaging, acoustic reflection, nasal pharyngoscopy, cephalometry and fluoroscopy. Authors also emphasize that the best method for evaluating obstruction during obstructive events remains controversial as individual patients have different patterns of upper airway narrowing.

The articles on Treatment of obstructive sleep apnoea¹² strongly recommends treatment of severe form as it is associated with increased morbidity and

mortality. As OSA is a chronic disorder, its treatment requires considerable effort and commitment from the patient. It also emphasizes need for management strategies in patients with mild to moderate OSA. Poor adherence to CPAP treatment remains a limiting factor in treating OSA. The review on Adherence to continuous positive airway pressure (CPAP) treatment for obstructive sleep apnoea¹³ describes factors that predict CPAP adherence and guidance for development of interventions to promote CPAP adherence. Current understanding of CPAP adherence suggests that it is a multi-factorial, complex clinical problem requiring similarly designed approaches to effectively address poor CPAP adherence in the OSA population. It also reviews the existing literature with regard to measuring, defining and predicting CPAP adherence; published intervention studies aimed at, promoting CPAP adherence and providing guidelines for future empiric study of CPAP adherence that will have implications for translational science. As CPAP is not tolerated by all OSA patients, the article on New generations of continuous positive airway pressure therapy¹⁴, suggests use of auto-adjustable positive airway pressure (APAP) devices for long-term management of OSA, these devices may also assist in the initial diagnosis of OSA and titration of conventional CPAP treatment. Although newer modalities such as C-Flex and A-Flex are promising, data regarding their efficacy with regard to cardiovascular outcomes are limited. Further studies will be required to validate their role.

The article on Surgical treatment of obstructive sleep apnoea¹⁵ describes methods to assess the sites of obstruction and a number of surgical procedures designed to address OSA. Review on Sleep Disordered Breathing (SDB) in patients with chronic kidney disease (CKD) highlights a high prevalence of SDB in patients with CKD and SDB contributes to excessive daytime somnolence, poor quality of life and increased cardiovascular morbidity and mortality in CKD patients¹⁶. Renal transplantation, nocturnal automated peritoneal dialysis and nocturnal haemodialysis have been associated with reduction in severity of SDB, better quality of life and decreased cardiovascular morbidity and mortality. The review on Sleep disordered breathing in women of childbearing age and during pregnancy emphasizes a need for an early diagnosis of OSA among pre-menopausal women¹⁷. Classic presentation of OSA may be missing in women and they frequently present with depression, complaints of fatigue and poor quality sleep. Women with polycystic ovary syndrome have higher level of androgens, lower

levels of progesterone and oestrogen and menstrual irregularities, obesity and are also at increased risk for hypertension, insulin resistance and OSA.

Older adults have increased prevalence of many primary sleep disorders including SDB, periodic limb movements during sleep, restless leg syndrome, REM sleep behaviour disorder, insomnia and circadian rhythm disturbances. Review on SDB in elderly discusses age-related changes in sleep architecture, aetiology, presentation, and treatment of sleep disorders among the elderly and other factors relevant to aging that are likely to affect sleep quality and quantity¹⁸.

The review on SDB in children highlights varied presentation that includes snoring, frequent arousals, enuresis and hyperactivity¹⁹. Presentation may vary according to age of the child. Children with Down syndrome, midface hypoplasia or neuromuscular disorders are at increased risk for SDB. Tonsillectomy and adenoidectomy are the first-line definitive treatment in children. Other treatment options include rapid maxillary expansion, allergy treatment and CPAP. Authors discuss importance of early diagnosis and treatment in children as consequences of untreated SDB include learning difficulties, memory loss, poor growth, depression and risk of hypertension.

The state-of-the-art review on Insomnia²⁰ highlights several points as it is the most prevalent sleep disorder affecting millions of people worldwide as either a primary or co-morbid condition. This disorder is associated with several effects including personal, societal, psychiatric and medical consequences. The evaluation of insomnia includes interview during which information about the specific complaint, co-morbid sleep, medical or psychiatric condition, treatment and substance use and family history are obtained. Review of sleep diaries, actigraphy and polysomnography may also provide additional information. Author discusses both sedative-hypnotic and cognitive behavioural interventions.

Parasomnias are abnormal behaviours/experiences during sleep that are subdivided into disorders of arousals, disorders of REM sleep or other parasomnias. The article on Parasomnias emphasizes a need for a thorough clinical evaluation with supporting data from a full PSG with time synchronized video²¹. The prognosis for arousal disorders is usually excellent, however, REM behaviour disorders (RBD) are associated with neurodegenerative disorders and require neurological surveillance. Although pharmacologic treatment has a limited role, use of clonazepam is effective in

majority of patients. Adequate patient and bed-partner education is an essential component of treatment for all parasomnias.

Review on Narcolepsy, co-morbidities and treatment describes a tetrad of classical presentation including excessive daytime sleepiness, cataplexy, sleep paralysis, and hypnagogic hallucinations²². While the exact cause remains unknown, hypocretin deficiency seems to play an important role. As several primary conditions can result in secondary narcolepsy, their exclusion is mandatory. Patient history, polysomnography and multiple sleep latency tests are essential for diagnosis. Symptomatic treatment, education and behavioural modification are essential elements of treatment. As classic pharmacologic treatments and newer treatment options have significant problems, newer modalities are being worked out to provide further options for treatment.

The article on Nocturnal hypoventilation–identifying and treating syndromes emphasizes a need for early diagnosis and treatment as untreated patients have impairments in daytime function, quality of life and premature mortality²³. Nocturnal monitoring of gas exchange with or without full PSG is essential for an early diagnosis. Non-invasive ventilation during sleep is the most appropriate approach as it reverses adverse consequences due to this condition.

There is a need to heighten awareness of various sleep disorders among primary physicians and general public. Well designed studies need to be carried out on prevalence of various sleep disorders, assess confounding effect of obesity on various consequences of OSA especially metabolic abnormalities and other co-morbidities. Careful screening should be done before referring patients for polysomnography because of its cost and poor access to the general public. Reversible causes such as hypothyroidism should be carefully ruled out before prescribing CPAP which incurs a prohibitive cost to the general public. CPAP remains the first-line of treatment for patients with moderately severe OSAS. Adherence to this form of treatment on a long-term basis remains a major concern which should be addressed.

Surendra K. Sharma

Division of Pulmonary

Critical Care & Sleep Medicine

Department of Medicine

All India Institute of Medical Sciences

New Delhi 110 029, India

surensk@gmail.com, sksharma@aiims.ac.in

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