Editorial

Sleep disorders are increasingly recognized as a serious medical problem in the general population as well as to an individual's well being [1]. Moreover, excessive daytime sleepiness (EDS) continues to be an important public health concern. EDS related to sleep disorders is present in about 10% of adults. Complaints such as non-restorative sleep, insomnia, and EDS are obtained from at least 50% of subjects in general population–based epidemiological surveys [2,3,4]. Medications available for treatment of various sleep disorders and their consequent impact on the quality of life represents an important aspect of public health expenses [5-7]. On the other hand, pharmacological advances for sleep disorders treatment represent exciting discoveries and may ultimately change the course of how we treat sleep-related disorders.

Insomnia is the most common sleep disorder with a prevalence of 10-15% in the United States adult population [2,3]. Currently approved pharmacologic treatments for insomnia include benzodiazepine receptor agonists, non-benzodiazepine receptor agonists, and melatonin receptor agonist. In addition, unapproved medications are commonly prescribed including sedating antidepressants, antipsychotics, anti-histamines, and herbal supplements. Many unapproved and approved hypnotics are associated with significant side-effect profile including cognitive and psychosocial impairment, anterograde amnesia, rebound insomnia, development of tolerance, addiction, and even death by overdose. It is not surprising that new pharmacological compounds are vigorously being investigated. In addition, Major Depressive Disorder is a common psychiatric disorder co-existing with insomnia [8-9], and the investigation of melatonin agonists such as agomelatine has demonstrated interactions between circadian rhythm disorders, sleep, mood, and important clinical benefits with this new type of drug.

Evidence from research has demonstrated that the neuropeptide hypocretin (orexin) is critical in arousal and stabilization of wakefulness. This discovery has paved the way for new and exciting research on pharmacological modulation of the hypocretin system in an effort to find new treatment modalities for insomnia. In addition, there is evidence that hypocretin is involved in energy homeostasis and reward behavior beyond its pivotal role in sleep/wake regulation [10,11].

Obstructive Sleep Apnea (OSA) is the most common sleep-related breathing disorder, affecting 5-10% of the adult population. It is increasingly being recognized as an important public health problem leading to driving and industrial accidents [12,13]. The gold-standard treatment for OSA with nasal CPAP is associated with variable compliance rates and therefore less than optimal treatment success. Usage of pharmacological agents to treat OSA has been in question for a long time, however in the recent past, studies have accumulated and results are just coming in. Research on sleep is focused on finding new compounds to treat EDS: from histamine (H_3) receptor antagonist and inverse agonist, to GABA-β agonists, to sodium oxybate. Discovery of new compounds that are successful in treating EDS will benefit disorders that cause excessive sleepiness including narcolepsy with cataplexy, obstructive sleep apnea, and shift-work.

Treatment of sleep-related problems in children is a dilemma for the pediatrician and sleep specialist. As of recent, investigation on dopamine agonists has been performed in children with Restless Leg Syndrome (RLS), a syndrome that has a prevalence of approximately 2%. Moreover, the frequency of attention deficit/hyperactivity syndrome (ADHD), depression, and anxiety is higher in children with RLS compared to the general population. The discussion of various pharmacological treatment approaches will be much appreciated in the pediatric community, as will the discussion on various compounds used in ADHD treatment and their impact on sleep, as sleep problems are both part of the symptoms themselves, as well as complications of treatment [14,15].

Similar to a double-edged sword, pharmacologic therapy has its risks and benefits which can be seen in individuals with chronic opioid use. The use of opioid medications has increased by approximately 600% in the last 10 years with a corresponding rise in pain management, greater attention paid to the treatment of pain syndromes, and higher percentage of prescriptions for opioid medications by general practitioners. This has led to an increase in the prevalence and types of breathing disorders during sleep including central sleep apnea, which are often not well recognized or understood, and is a challenge to treat [16].

This issue of *Current Pharmaceutical Design* focuses on advances in pharmacological treatment of the major sleep-related disorders. Current research, advances in pharmacologic therapy, as well as prospective pharmacological compounds for the treatment of sleep-related disorders will be discussed.

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