**Connection Between HIV and Sleep Apnea**

**Introduction**

Human Immunodeficiency Virus (HIV) a type of virus responsible for a condition called AIDS. HIV destabilizes or weakens the body’s immune system and destroys a type of cells (CD4 helper lymphocyte cells) that help fight off diseases (Lo Re, Schutte-Rodin & Kostman, 2006). When the body is left defenseless, it can no longer protect itself, leading to the eventual Acquired Immunodeficiency Syndrome (AIDS).  HIV is caused by a myriad of factors that suggest an exchange of body fluids such as blood. Any method or occurrence that may lead to the transfer of body fluids from an infected person to a healthy person will lead to HIV. Such include sexual intercourse, sharing of contaminated needles, blood transfusion, childbirth, and even breastfeeding. On the other hand, sleep apnea is a critical disorder associated with sleep in which a person’s breathing occurs erratically, starting and stopping several times during sleep (Njamnshi et al., 2017).  This condition varies in intensity and may mean that the person experiences the on-off breathing up to over a hundred times in a night. When Sleep apnea occurs, the brain and other body parts fail to get enough oxygen during sleep.

**HIV and sleep apnea**

Studies suggest that obstructive sleep apnea is directly related to HIV. According to Patil et al., (2014), HIV patients who are put under highly active antiretroviral therapy (HAART) develop symptoms that directly lead to apnea. These patients gain weight and acquire lipodystrophy; a condition characterized by abnormal fat distribution in the body. Also, it is noted that the patients exhibit fatigue, snoring, and daytime sleepiness, all which indicate towards apnea (Patil et al., 2014).  Patil et al., (2014) also claim that HAART is directly responsible for a patient’s morphological and metabolic changes and conditions like resistance to insulin, hypertension, and hyperlipidemia. It is, therefore, discussed that those living with HIV expose their bodies and systems to potential actuators of apnea. For example, visceral adiposity, a condition induced by HIV infection and HAART, is seen to increase production of somnogenic cytokines (Patil et al., 2014). These cytokines lead to impairment of the upper airway neural control which in turn causes or increases chances of sleep apnea (Patil et al., 2014). HIV is further attributed to change of pharynx anatomy and also erroneous neuromuscular control of the upper part of the trachea, both of which are determinants of apnea. Though these conditions could occur to anybody and especially with an increase in age, HIV is a propellant.  A condition called adenotonsillar hypertrophy for example directly leads to the narrowing of the airway which may lead to sleep apnea (Patil et al., 2014).

In another study conducted by Taibi (2013), it was noted that there is a high risk of obstructive sleep apnea in people living with HIV. Use of ART is known to cause lipodystrophy which manifests itself by the accumulation of fat deposits both in the neck, the thorax, and abdomen (Taibi, 2013). These deposits directly lead to breathing difficulties since there is an increased effort in breathing. This is especially true with the deposits on the neck. Fat deposition due to ART also leads to hypoventilation; a condition caused by below-par ventilation required for gaseous exchange in the body (Taibi, 2013).  Apart from ART dynamics, the kind of lifestyle amongst people living with HIV also contributes to apnea. For example, these people may gain weight due to lack of physical activities. This weight eventually leads to accumulation of unhealthy fats around body organs and vital parts such as the trachea, leading to obstructive sleep apnea. According to Taibi (2013), the side effects of some of the medications prescribed to people living with HIV is also responsible for apnea. The drugs given to the patients may work in suppressing the HIV condition, but while at it, give off unwanted effects such as inflammation, chemical imbalance, and fatigue that lead to apnea (Taibi, 2013). Use of one such drug, opioid, has been proven to lead to high rates of apnea amongst patients with HIV.

In yet another study on the relationship between obstructive sleep apnea and HIV, it was noted that majority of the patients with HIV also displayed symptoms and complained of apnea (Lo Re, Schutte-Rodin & Kostman, 2006). Some patients had already been experiencing apnea, except that they were not aware of this condition. Upon diagnosis, they were found to have obstructive sleep apnea that was characterized by daytime sleepiness, snoring, and other sleeping disorders (Lo Re, Schutte-Rodin & Kostman, 2006). A sleep survey based on Epworth Sleepiness Scale (ESS) and the Hawaii Sleep Questionnaire likewise conducted in the study showed that most of the HIV patients had symptoms of sleep apnea that included fatigue and physical tiredness (Lo Re, Schutte-Rodin & Kostman, 2006). Drawing from this study, it is noted that risk factors for apnea for people living with HIV include increased neck circumference, obesity and being overweight, and inappropriate body mass index (Lo Re, Schutte-Rodin & Kostman, 2006).

HIV has also been known to lead to enlargement of the tonsils and adenoids amongst patients. According to Rout et al. (2012), neck and head symptoms of AIDS are among the notable complications of adenoid hypertrophy. This is true in situations where the disease has been left unmitigated or when in advance stages, such as the AIDS stage. In such cases, either Obstructive Sleep Apnea or the Central sleep apnea can occur.  Obstructive Sleep Apnea, abbreviated as OSA, is the most common type (Njamnshi et al., 2017). It is characterized by the blocking of the trachea. In OSA, this blockage is due to collapse of soft tissue located at the back of the throat during sleep time. The latter type of apnea is caused by the brain's inability to control the muscles and direct them to breathe. This is attributed to the unstable nature of the respiratory control center that controls human breathing during sleep, and at all times. All these can occur or develop because of the various complexities and instabilities brought about by the advanced stages of AIDS (Rout et al., 2012).

**Conclusion**

 There is a vital relationship between HIV and sleep apnea. as shown by the studies, a majority of the causes of obstructive sleep apnea is due to Anti-Retroviral Therapy and highly active antiretroviral therapy. These two have a direct effect on the body fat increase on the airway and other places as well to increase the probability of sleep apnea. though age and weight are the proven and well-tested risk factors for apnea, it is different for people living with HIV. They can contract the disorder even when they are young or thin. More research needs to be done on the relationship between these two things before meaningful conclusions are made. At present though, all factors indicate towards a relationship between sleep apnea and HIV in the direction of ART and HAART. Those affected by this disorder should seek medical attention and get recommendations on how well to deal with it.

**References**

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