Editorial

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Obstructive sleep apnea (OSA) worsens the oxidative stress in down syndrome (DS)

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Editorial

Down syndrome (Ds) is a genetic disorder caused when abnormal cell division results in triplication of chromosome 21. This genetic disorder, which varies in severity, causes intellectual disability, thyroid disease, and andseveral health problems.

Down syndrome is the most common genetic chromosomal disorder and cause of learning disabilities in children. Understanding the mechanism of the disease and its relation to OSA is a paramount in caring for such kids. Superoxide dismutase-1 (SOD-1) gene on the triplicated 21st chromosome is almost 50% overexpressed in DS. This will cause overproduction of H2O2 to a limit that exceeds the capacity of the other antioxidant enzymatic systems; namely the glutathione peroxidase and catalase, leading to higher level of free radicles in DS.

The toxicity of the free radicles in DS would explain the morphological features, immune disorder, risk of leukemia, thyroid disease, early aging as well as intellectual impairment in DS.[1,2] DS kids have a higher incidence of obstructive sleep apnea (OSA).[3] known to increase body inflammation, oxidative stress. Hypoxic conditions associated with OSA can be responsible for oxidative stress. Formation of Reactive *oxygen* species (ROS) can be directly caused by hypoxia or indirectly after re-oxygenation. OSA may contribute to the oxidative stress partly through hypoxia.

OSA through producing extra oxidative stress will increase the risk of immune impairment, leukemia, thyroid disease, early aging as well as intellectual impairment in DS. We believe that the mechanism to the proven cognitive function impairment in DS.[4] And in OSA patients in general is through inflammation and ROS, which affect the prefrontal cortex.

Acknowledgments

None.

Conflicts of Interset

None.

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