OBSTRUCTIVE SLEEP APNEA AND DOWN SYNDROME

Acknowledgement:

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Apnea (literally, "without breath") is the term used when someone stops breathing for very short periods of time, usually 10 to 20 seconds. It's termed "obstructive" when respiratory efforts continue, such as movements of the chest. It's termed "central" when all respiratory effort stops. There is also a mixed version. In children, sleep apnea is almost always obstructive. During the apneic episode, the child will have decreased oxygenation of the blood.

Symptoms of Obstructive Sleep Apnea (OSA) are: snoring, restless/disturbed sleep, frequent partial or total wakening's and daytime mouth breathing. Some children with OSA have odd sleep positions, often with their neck bent backwards, or even in a sitting position. Some children with OSA sweat profusely during sleep. In adults, there is an association of obesity, but that's not a common association in children. Some children will have daytime grumpiness or sleepiness, but it's not common. Some children may have noisy swallowing as well.

Children with Down syndrome (DS) are certainly at risk for OSA. In 1991, one study showed 45% had OSA. This can be caused by several different factors present in DS: the flattened midface, narrowed nasopharyngeal area, low tone of the muscles of the upper airway and enlarged adenoids and/or tonsils.

Why is this important? Well, first, there's the obvious problem of the child not getting enough quality sleep and the behavioral effects that brings. Second, I've mentioned above that during sleep apnea, the oxygenation of the blood decreases. It has been shown that in children with DS and heart disease this low oxygenation causes an increase in the blood pressure in the lungs as the body tries to get more oxygen. This "pulmonary hypertension" can cause the right side of the heart to become enlarged and other cardiac complications can follow. The incidence of death due to OSA is unknown.

If you're unsure if your child has OSA, the way to test is through a sleep study, also called polysomnography. This test is performed overnight in a hospital (though some doctors will do "nap sonography") and consists of continuous monitoring of the oxygen in the blood, as well as monitoring chest wall movements (to assess respiratory efforts) and the flow of air through the nose. Some doctors also measure carbon dioxide in the blood or exhaled air. This is usually performed by otolaryngologists or neonatologists.

The treatment of OSA is usually removal of adenoids and/or tonsils. Various studies have been done on children with DS, and this appears to relieve OSA in most cases. However, it has been estimated that 30 to 40% of children with DS and OSA develop recurrent or persistent OSA even after removal of the tonsils and adenoids. There are several different reasons for this, including a large tongue, blockage of the airway by movement of the tongue during sleep, low muscle tone of the area of the airway just below the throat, and regrowth of the adenoids. When there is some concern regarding the effectiveness of the initial surgery, then post-surgical polysomnography is needed to document the OSA. Some centers are now using a type of MRI that takes sequential pictures of the airway while the child or adult is asleep to evaluate possible causes for persistent or recurrent OSA, and basing further surgery on those results; this is described in more detail in this study.

In adults and children in whom surgical treatment has failed or was not indicated, one therapy is "continuous positive airway pressure," or CPAP. This is administered by a nasal mask or tube during sleep. The tube/mask administers air with an amount of pressure designed to keep the airway open.

One final note about adenotonsillectomies in children with DS: this should not be considered day surgery. Studies have shown that after T&A's, children with DS have longer periods of decreased oxygenation and a slower time to recovery.

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