Tonsillectomy and Weight Gain in Children, Is There a Correlation?

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Tonsillectomy and Weight Gain in Children, Is There a Correlation?

Abstract
The relationship between tonsillectomy and postoperative weight gain in children has been studied across the globe. Indications for tonsillectomy include chronic recurrent tonsillitis and obstructive sleep apnea. This phenomenon of weight gain postoperatively and the many possible causes were the focus of this systematic review. Relationships between adenotonsillectomy/tonsillectomy, dietary habits, obstructive sleep apnea, motor activity, hyperactivity, insulin-like growth factor-1, insulin growth factor binding protein -3, and weight gain were investigated. Findings supported a relationship between adenotonsillectomy/tonsillectomy and postoperative weight gain, decreased sleep apnea, decreased motor activity and hyperactivity, an affinity for sugary and fatty foods, and an increase in insulin growth factor binding protein -3 in children. While an increase in weight was found postoperatively, an increase in height was not found to be statistically significant. With increasing concerns regarding the rise in obesity in our society, further research in this area regarding this phenomenon may lead to the development of guidelines for post recovery dietary and exercise habits. These guidelines could then be utilized to educate parents and primary care providers in an effort to minimize or prevent the occurrence of obesity in children post adenotonsillectomy/tonsillectomy.

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Background and Significance

- Adenotonsillectomy is the second most common ambulatory procedure performed in children in the United States (Smith et al., 2012).
- Indications for adenotonsillectomy include obstructive sleep disordered breathing such as obstructive sleep apnea, and recurrent or chronic tonsillitis (Smith et al., 2012).
- Adenotonsil hyper trophy is the most common cause of obstructive sleep apnea in children, and adenotonsillectomy is the primary treatment for this condition (Roemmich et al., 2006).
- In some studies, adenotonsillectomy or tonsillectomy alone has been associated with postoperative weight increase in children.
- Studies conducted in the United States as well as Ireland, Brazil, Turkey, Netherlands, and Europe have looked at this phenomenon in hopes to better understand if there is a correlation between adenotonsillectomy or tonsillectomy and postoperative weight gain.

Purpose

To systematically and comprehensively review, analyze and synthesize empirical evidence that has been published 1997-2013 regarding weight increase post-adenotonsillectomy or tonsillectomy.

Research Question

Is there a relationship between adenotonsillectomy or tonsillectomy and postoperative weight gain in children and what are the possible causes?

Methods

- Guided by Garrard’s (2011) matrix method
- Clearly delineated literature search and inclusion criteria
- Systematic review, analysis and synthesis of data

Literature Search

- Well-defined comprehensive search strategy (Table 1).
- Hand search of reference list in addition to databases until confident that all salient publications were obtained.
- Key words: adenotonsillectomy, weight gain, children.
- Databases used: CINAHL, PubMed @ Fisher, ProQuest Nursing and Allied Health.

Systematic Review, Analysis and Synthesis

- All research checked and determined if applicable based on search criteria and key terms.
- Systematically reviewed all articles.
- Construction and analysis of literature matrix.
- Initial focus on reviewing weight gain during postoperative period following adenotonsillectomy or tonsillectomy.
- Subsequent focus on causes associated with weight gain post-adenotonsillectomy or tonsillectomy.

Table 1: Search Terms and Results

<table>
<thead>
<tr>
<th>Database</th>
<th>“weight gain”</th>
<th>“children”</th>
<th>“weight gain &amp; children”</th>
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<tr>
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<td>817</td>
<td>76</td>
</tr>
</tbody>
</table>

Inclusion Criteria

- Published in the English language.
- Full text primary source.
- Inclusion of children as primary population.

Exclusion Criteria

- Not published in the English language.
- Full text primary source not obtainable.
- Journal not available through University library.
- Journal requiring fee for article.

Results

- Final sample (n=8).
- Publications from 1997-2013.
- No bulk publications from the same author(s).
- No replication studies.
- Studies conducted in the United States, Ireland, Brazil, Turkey, Netherlands, and Europe.
- Quantitative descriptive correlational, and prospective cohort studies.
- Articles ranged in topic from analysis of the relationship between adenotonsillectomy/tonsillectomy, dietary habits, obstructive sleep apnea, motor activity, hyperactivity, insulin-like growth factor-1, insulin growth factor binding protein-3, and postoperative weight gain.
- Findings supported an increase in weight, decrease in sleep apnea, decrease in motor activity and hyperactivity, an affinity for sugary and fatty foods, and an increase in insulin growth factor binding protein-3 post-adenotonsillectomy/tonsillectomy in children.
- One study showed that an adenotonsillectomy in the first seven years of life was associated with an increased risk of overweight and obesity at the age of eight.
- While weight gain was found to be statistically significant postoperatively, an increase in weight was not found to be statistically significant.

Discussion/Conclusion

- For some children who require an adenotonsillectomy or tonsillectomy, weight increase postoperatively can be beneficial, such as those who have failure to thrive.
- Studies have shown a correlation between adenotonsillectomy or tonsillectomy and weight gain postoperatively.
- Weight gain may be due to a decrease in motor activity and hyperactivity that occurs with the resolution of obstructive sleep apnea after surgery. This decreased activity may be related to a decrease in the amount of time spent in Stage I sleep postoperatively.
- Children who were overweight prior to having adenotonsillectomy or tonsillectomy continued to increase their weight after surgery.
- Children who have adenotonsillar hypertrophy and subsequent adenotonsillectomy tend to eat more calories from foods high in sugar, sugary soft drinks and fats.
- Educating parents of the possibility of weight gain after adenotonsillectomy, and providing them with a dietary habit and exercise guideline would be beneficial to the postoperative and post recovery health and wellness of children treated with an adenotonsillectomy.

Limitations

- Sample size.
- Lack of a control group.
- Varied time range for follow up.
- Standardization for weight scales used.

Recommendations

- Further studies examining the relationship between adenotonsillar hypertrophy, growth, obstructive sleep apnea, dietary habits, motor activity/hyperactivity, adenotonsillectomy and cause of weight increase.
- Development of dietary and exercise education guidelines for parents of children who undergo adenotonsillectomy.

References

A full reference list is available upon request.