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Artigo Original  
HEMORRAGIA PÓS-AMIGDALECTOMIA:  
CULPA DA DIETA?

POSTTONSILLECTOMY BLEEDING:  
BLAME ON DIET?

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## Resumo

### Introdução.

Cre-se que a recomendação de restrições alimentares após-amigdalectomia estejam correlacionadas com uma menor taxa de hemorragia, no entanto, poucos estudos abordaram esta questão. Este estudo compara os efeitos da dieta restrita (DR) versus dieta sem restrições (DSR) na taxa de hemorragia pós-amigdalectomia, dor e peso.

### Material e métodos.

Estudo prospectivo controlado, ao longo de um ano 100 crianças que foram submetidas a amigdalectomia (com ou sem adenoidectomia) foram alocadas aleatoriamente em 2 grupos. Um total de 48 pacientes foram alocados no grupo DR, e 52 pacientes no grupo DSR.

### Resultados.

A idade variou entre 3 a 14 anos. A principal indicação para amigdalectomia foi distúrbio respiratório do sono (57%). Um doente do grupo DR foi admitido no hospital devido a hemorragia secundária autolimitada. A diferença na taxa de hemorragia pós-amigdalectomia ( $P = 0,795$ ), escala média de dor ( $P = 0,703$ ) e número de dias necessários retorno a dieta normal ( $P = 0,666$ ), não foi estatisticamente significativas entre grupos. A alteração de peso antes e depois da cirurgia não foi estatisticamente diferente no grupo DSR ( $P = 0,777$ ), no entanto, houve uma diferença estatística no grupo DR ( $P = 0,000$ ) de 28,46 a 27,63 kg. O tempo para retorno à dieta normal foi de  $3,32 \pm 0,343$  dias no grupo DSR.

### Conclusão.

Não encontramos nenhum efeito da DR na taxa de hemorragia pós-amigdalectomia ou na escala de dor entre os grupos. Ainda assim, o DR teve um efeito desfavorável no peso. Esses resultados favorecem a recomendação de um DSR

### Palavras chave:

Amigdalectomia, dieta, hemorragia, dor, otorrinolaringologia pediátrica

## Abstract

### Introduction.

There is a common belief that dietary restrictions in posttonsillectomy are correlated with a minor posttonsillectomy bleeding rate, however, few studies have addressed this. This study compares the effects of restricted diet (RD) vs unrestricted diet (URD) on posttonsillectomy bleeding rate, pain score, weight change and return to a normal diet.

### Material and Methods.

Prospective randomized controlled trial over one year, 100 children who underwent tonsillectomy (with or without adenoidectomy) were randomly allocated into 2 groups. A total of 48 patients were allocated in the RD group, and 52 patients were allocated in the URD group.

### Results.

Participants' age range was 3 to 14 years. The main indication for tonsillectomy was sleep-disordered breathing (57%). One patient in the RD group was admitted to the hospital due to secondary self-limited bleeding. Difference in posttonsillectomy bleeding rate ( $P=.795$ ), mean pain score ( $P=.703$ ) and number of days needed for a free pain score ( $P=.666$ ), weren't statistically significant between groups. Weight change before and after surgery wasn't statistically different in the URD group ( $P=.777$ ), however there was a statistically difference in the RD group ( $P=.000$ ) from 28,46 to 27,63 Kg. Time for return to normal diet was  $3,32 \pm 0,343$  days in URD group.

### Conclusion.

We found no effect of unrestricted diet in posttonsillectomy bleeding rate or pain score between groups. Still, RD had an unfavorable effect on weight. These results favor the recommendation for an URD

### Keywords:

tonsillectomy diet, tonsillectomy bleeding, pain, pediatric otolaryngology

## Introduction

Tonsillectomy is one of the most frequently performed surgery, especially in the pediatric population.<sup>1</sup> Its postoperative period is known for having a high morbidity in terms of pain, weight loss, and bleeding.

Posttonsillectomy bleeding is the most common and serious complication. Many factors, such as operative technique, perioperative medication have been studied in great detail for many years to identify tonsillectomy bleeding risk factors. However, the influence of postoperative diet on bleeding hasn't been widely evaluated, raising some questions and concerns for parent's caregivers in the postoperative period.

Traditionally most Otolaryngologist surgeons, recommend a cold and soft diet, based on the fact that hot and solid food might lead to posttonsillectomy bleeding, infection, pain and nausea as well as retard normal healing of pharyngeal mucosa.<sup>2</sup> Others believe that by eliminating lukewarm beverages, we can prevent vessel dilation in the operative site.<sup>3,4</sup> On the other hand, there are those children who ask for their regular diet, and in some cases, they even ask for junk food. Finally, a third point of view recommends that patients eat whatever they desire or whatever they can tolerate.<sup>5-7</sup>

Given the frequency of parent's caregiver's enquiry, the discordance of opinions, the lack of studies on the influence of diet on the posttonsillectomy bleeding rate and the health burden of the postoperative period, the authors conducted a study to determine if an unrestricted regime is an appropriate posttonsillectomy diet. The aim of our study was to evaluate the impact of an unrestricted diet on posttonsillectomy bleeding, pain, and weight. Our hypothesis was that there is no difference regarding posttonsillectomy pain and bleeding between the two groups but the restricted diet might have had an unfavorable impact on weight.

## Material and Methods

This was an open prospective randomized controlled trial, carried out in the Otolaryngology Department of North Lisbon University Hospital Center, affiliated with the Lisbon University of Medical Faculty, which is one of the referral otolaryngology centers in Portugal. One otolaryngology resident supervised and followed patients and collected the data. The research protocol was approved by the North Lisbon University Hospital Center and the Academic Center of Medicine of Lisbon Ethics Committee. Written informed consent was obtained from all patients. All procedures performed involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Inclusion criteria were (1) age range from 3 to 17 years, (2) patients who had undergone tonsillectomy (with or without adenoidectomy) due to recurrent tonsillitis or sleep-disordered breathing, and (3) minimum education level of parents of at least a high school diploma. Exclusion criteria were (1) preoperative medical problems, such as diabetes, coagulation disorders, cardiovascular disease, congenital disorders, basic metabolic disorder, chronic liver or renal disease, and cognitive impairment (2) inadequate follow-up and (3) partial tonsillectomy.

Over one year, 148 patients were recruited to participate in this study. However, 44 were excluded due to not meeting the inclusion criteria.

A total of 104 patients were randomly divided into two groups. The participants operated in even weeks were assigned to restricted diet (RD) and the ones operated in the uneven weeks were assigned to an unrestricted diet (URD). A total of 52 patients were assigned to the restricted posttonsillectomy diet group (control group), and 52 patients were assigned to the unrestricted diet group.

The primary outcome was defined as posttonsillectomy bleeding within 15 days after surgery. Secondary outcomes were defined as mean pain score and weight change within 15 days after surgery, the number of days needed for a free pain score and time to return to a normal diet in the unrestricted diet group.

A patient was considered to have posttonsillectomy bleeding when he or she (1) developed simple oropharyngeal bleeding that required electrical or chemical cauterization requiring outpatient management, (2) had complicated bleeding that required hospitalization merely for observation, or (3) required surgical intervention.

Pain was evaluated three times a day (before the main meals) by a Visual Analog Scale (VAS) (figure 1) by caregivers, who received an education on how to use the scale (from face 0 that doesn't hurt at all to face 10 that hurts as much as you can imagine, although you don't have to be crying to have this worst pain.)



Figure 1 - Wong-Baker FACES Pain Rating Scale

Restricted diet was defined as cold and liquid diet for the first 3 days, followed by a lukewarm and soft diet from 4th to 7th day, hot and soft diet between 8th and 12th day and a solid diet after the 13th day (figure 2).



Figure 2 - Progression of diet on the restricted diet group

Table 1 with consistency examples of food was given to parents in both groups in order to improve consistency of dietary diary register.

Liquid	Soft	Solid
Water	Soups	Rice
Juice	Mashed potatoes	Pasta
Milk	Gelatin	Vegetables
Milkshake	Ice cream	Fish
Smoothies	Baked fruit	Meat
	Scrambled eggs	Wafers

Table 1 - Examples of food consistency

The consistency (liquid, soft or solid) and temperature (cold, lukewarm, hot) of the food were registered three times a day by parent's caregivers (table 2).

Postoperative Day	Consistency			Temperature		
	Liquid	Soft	Solid	Cold	Lukewarm	Hot
1 <sup>o</sup>	1	2	3	1	2	3
2 <sup>o</sup>	1	2	3	1	2	3
...	...	...	...	...	...	...
15 <sup>o</sup>	1	2	3	1	2	3

Table 2 - Daily diary of food consistency and temperature

Because our center is the main otolaryngology center in the city, we advised the patients to refer to our emergency department as soon as they developed any bleeding. Also, the otolaryngology resident did the follow-up and recorded the bleeding rates.

The same technique of surgery and method of anesthesia was used for all patients, although not all patients were operated by the same surgeon. Adenoidectomy was performed by curette, and hemostasis was achieved through nasopharyngeal packing. Next, tonsillectomy was performed by cold dissection, and hemostasis was done by bipolar electrocautery. During the first 6 hours after surgery, patients' conditions were assessed for vital signs, pain, and hemorrhage by a nurse in the otolaryngology ward. All patients were discharged before 24 hours after surgery. All parents were given verbal and written information regarding the postoperative diet. Both groups were prescribed paracetamol syrup in a dosage of 15 mg/kg every 6 hours during 7 days, and ibuprofen syrup in a dosage of 7,5 mg/kg if their pain score was more than 3. A special questionnaire was given to each parent that consisted of charts to record the daily pain score according to the Wong Baker FACES Pain Rating Scale, translated for Portuguese<sup>8</sup>. Weight (kg) was recorded by the same nurse and the same weight balance on the day of the surgery and fifteen days after. All patients were observed by an otolaryngology fifteen days after surgery. All the recorded data from questionnaires were collected by the same otolaryngology resident in the clinic.

Statistical analysis was done using repeated measures analysis of variance; non-parametric tests, such as Wilcoxon Signed Ranks Test and Mann-Whitney U test were used for comparing the results. All statistical analyses were carried out using SPSS® software version 18 (SPSS, Inc, an IBM Company, Chicago, Illinois).



## Results

A total of 148 patients entered this study; initially, 44 were excluded since they did not meet the inclusion criteria to participate. The rest were randomly divided into 2 groups of 104 patients. In the restricted diet group, 4 patients were excluded due to a breach of the diet regime, violating the study protocol. At the end of the study, 48 patients in the restricted diet group (48%) and 52 in the unrestricted diet group (52%) returned for analysis. Participants' age range was 3 to 14 years. Both groups were similar with respect to sex ( $P=.45$ ) but not to age, where the restricted diet group was slightly older ( $6,71 \pm 2,6$  (range 3-14) than the URD ( $5,69 \pm 2,1$  (range 3-10) ( $P=.04$ ). The main indication for tonsillectomy was sleep-disordered breathing (57%), followed by recurrent tonsillitis (39%) and mixed (4%).

None patient in either group had primary bleeding within the first 24 hours. One patient in the restricted diet group was admitted to the hospital due to a secondary self-limited bleeding. Also, the secondary bleeding rate was not statistically significant between groups ( $P = .795$ ).

There was no significantly higher level of pain in the restricted diet group in comparison with the unrestricted diet group ( $P = .703$ ). In the RD group, the number of days needed for a free pain score was  $8,19 \pm 0,301$  (IC 7,1 a 9,17) and 7,6 days  $\pm 0,535$  (IC 6,5 a 8, 68), this wasn't a statically significant ( $P=.666$ ). Weight change before and after surgery wasn't statistically different in the URD ( $P=.777$ ). However, there was a statistically difference in the RD ( $P=.000$ ) from 28,46 to 27,63 Kg. Patients in the URD took 3,32 days  $\pm 0,343$  (IC 2,655 a 3,999) for return to normal (solid and hot) diet.

	RD (n=48)		URD (n=52)	P value	Test
Sex, male, No (%)	54		61	0,45	Man - Whitney
Age, mean +/- SD (range)	6,71 $\pm$ 2,6 (3-14)		5,69 $\pm$ 2,1 (3-10)	<b>0,043*</b>	Man - Whitney
Posttonsilectomy Bleeding	1		0	0,795	Man - Whitney
Weight change	Pre-operative	28,46	23,15	-	WilCoxon
	Post-operative	27,63	23,10	-	
	Diference	( $P=.000$ )	( $P=.777$ )	-	
N° of days for zero pain level	8,19 days $\pm$ 0,301 (IC 7,1 a 9,17)		7,6 days $\pm$ 0,535 (IC 6,5 a 8, 68)	0,666	Mantel-Cox
Mean pain level	1,16 $\pm$ 0,76		1,00 $\pm$ 0,8	0,703	Man - Whitney

Table 3 - Summary of results

## Discussion

In our study, we found no statistically significant differences between RD and URD regarding posttonsillectomy pain and bleeding. However, we did notice an unfavorable effect on weight in the RD group.

Some studies have tried to understand the influence of diet after tonsillectomy. Nonetheless, literature reviewing shows a disparity between post-operative diet recommendations. In 2014, the French Oto-Rhino-Laryngology—Head and Neck Surgery Society designed a comprehensive clinical practice guideline to manage posttonsillectomy pain<sup>9</sup>. It concluded that instructions given by otolaryngologists varied significantly from clinic to clinic and within centers from surgeon to surgeon. Most Otolaryngologists follow the traditional opinion is that soft or cold diets are beneficial in reducing postoperative pain as well as in reducing the risk of bleeding.<sup>10,11,12</sup> In fact, according to United Kingdom National Prospective Tonsillectomy Audit it seems that recommendations regarding post-operative diets of hot or cold foods, or even crunchy or soft foods, do not statistically affect recovery.<sup>13</sup> A survey by Kay et al showed that most American Society of Pediatric Otolaryngology members believe in dietary restrictions following tonsillectomy.<sup>5</sup> Even so, there is no reference regarding the posttonsillectomy diet on the new clinical practice guideline by the American Academy of Otolaryngology-Head and Neck.<sup>14</sup>

On the contrary, Talbot opposed to the use of cold and soft diet, as he believed that muscle spasm at the site of tonsillectomy is the main cause of pain, and the pain would be reduced by chewing, thus stretching the affected muscles.<sup>15</sup>

There aren't many reports about the possible effect of a posttonsillectomy diet on pain and bleeding. Cook et al performed a randomized controlled study on 150 patients older than 16 years and evaluated 3 different types of diet: soft, crunchy, or unrestricted diet.<sup>16</sup> However, they did not state their method of operation, and tonsillectomy was performed by a team of surgeons. Thus, the surgeons' experience might be a confounding factor. They found no difference between groups in terms of pain or bleeding. Recommending patients to consume their regular diet.<sup>16</sup> In 1993, Brodsky et al assessed 2 groups of children who had undergone tonsillectomy (liquids/soft diet vs regular food). Like Cook et al, no significant difference was found in terms of pain or bleeding. However, it seems that none of the group members obeyed the postoperative instruction regarding their diet.<sup>17</sup> Hall and Brodsky conducted a non-randomized study of 100 children on the effect of liquid/soft vs unrestricted diet only found no significant difference regarding pain score.<sup>17</sup> Nonetheless, this study was limited in time, during only the initial 12 hours after the operation.

There are a lot of studies that focused on the honey's intrinsic healing effects however, the latest Cochrane review on this issue reported that evidence on its effect is low and should not represent a robust basis for decision making.<sup>18</sup>

Other studies have evaluated the influence of diet and physical activity on the postoperative period. A prospective study by Zagolski<sup>2</sup> assessed the effect of restricted vs unrestricted diet and physical activity on 800 children who underwent adenoidectomy (n=413) or partial adenotonsillectomy (n=287). The authors found an increased bleeding rate in the restricted groups, and low pain scores in the unrestricted group. We emphasized that the majority of children underwent only adenoidectomies, which was a confounding factor when the result was interpreted. Manica et al<sup>7</sup> conducted a randomized clinical trial comparing restricted diet and physical activity vs unrestricted diet and physical activity on 95 children. The authors did not find any significant difference in pain score between the groups. More recently, Mohammad Faramarzi et al<sup>19</sup>, compared cold/liquid diet vs regular diet on 194 children submitted to adenotonsillectomy or tonsillectomy. There were no statistically significant differences between the cold/liquid posttonsillectomy diet and regu-

lar diet regarding posttonsillectomy pain and bleeding. However, all patients were prescribed antibiotics in the post-operative period and the follow-up was limited to 10 days with no information regarding weight changes.

Our study showed that an unrestricted posttonsillectomy diet might not be associated with a higher rate of bleeding. In fact, in our sample, the only posttonsillectomy bleeding occurred in the restricted diet group, on the third day and so it was not associated with a change of consistency or temperature of food.

It is important to note that a restricted diet, had a statically significant unfavorable effect on weight fifteen days after surgery. This mean that these patients were deprived of their dietary needs, delaying their recovery and increasing the post-operative morbidity.

Our outcomes are in agreement with the results of two different systematic review conducted by Banister<sup>20</sup> and Millington<sup>21</sup>.

The authors believe that the design of this study, which was a randomized clinical trial, was one of its strengths, as well as the long follow-up period and, to our knowledge, this was the first study to evaluate the effect of a posttonsillectomy diet on weight. As limitations of this study, the authors highlight the small sample size.

## Conclusion

In conclusion, we found no correlation between posttonsillectomy diet and pain. Also, diet according to patient's tolerance does not seem to increase the bleeding rate. Still, a restricted diet had an unfavorable effect on weight, increasing morbidity in the post-operative period. These results favor the recommendation for an unrestricted posttonsillectomy diet. Further multicenter studies with larger populations are recommended to show the effect of a posttonsillectomy diet on postoperative bleeding.

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