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Secondary tonsillectomy haemorrhage and non-steroidal anti-inflammatory drugs

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Abstract

Modern non-steroidal anti-inflammatory drugs (NSAIDs), are now widely accepted analgesics for post-tonsillectomy patients, but their effect on secondary haemorrhage has not been fully evaluated.

This study attempts to evaluate the influence of NSAIDs on the secondary haemorrhage rate, and also whether mode of dissection is an important factor.

The records of 557 consecutive patients undergoing tonsillectomy were studied to determine if there was a relationship between the secondary haemorrhage rate and discharge prescription of NSAIDs.

There was an overall secondary haemorrhage rate of 5.2 per cent (29) and a significantly increased secondary haemorrhage rate in those taking regular NSAIDs, 11 per cent, compared to those not taking NSAIDs, 1.47 per cent, ($\chi^2_1 = 41.25$, $p<0.001$).

There was a higher rate of secondary haemorrhages with bipolar dissection than with standard dissection for both those taking and not taking NSAIDs (13 per cent *vs* seven per cent and 2.75 per cent *vs* 0.87 per cent) however this was not statistically significant ($\chi^2_1 = 1.17$, $p = 0.19$ and $\chi^2_1 = 0.773$, $p = 0.17$). Both bipolar dissection and standard dissection individually showed very significant increases in secondary haemorrhage rate when on regular NSAIDs ($\chi^2_1 = 14.03$, $p = 0.004$ and $\chi^2_1 = 6.19$, $p = 0.003$).

Although NSAIDs are very good analgesics, they may cause an increased secondary haemorrhage rate, and should be prescribed at discharge prescription with caution.

Key words: Tonsillectomy; Haemorrhage; Analgesia, non-steroidal anti-inflammatory agents

Introduction

Tonsillectomy is a common operation which causes moderate to severe post-operative pain usually for at least four to five days (Murthy and Laing, 1998), and NSAIDs have been shown to be effective analgesics for post-tonsillectomy patients by many authors (Dommerby and Dasmusser, 1984; Kotecha *et al.*, 1991).

There has been some doubt expressed as to whether NSAIDs cause an increase in the post-tonsillectomy haemorrhage rate (Robinson and Ahmed, 1994). These doubts, although not proven, have mainly been concerned with reactionary/primary haemorrhage. We concentrated our study on secondary haemorrhage.

Aspirin has been shown to cause an increased secondary haemorrhage rate post-tonsillectomy (Reuter and Montgomery, 1984; Stage *et al.*, 1988). This is brought about by aspirin's irreversible inactivation of cyclo-oxygenase (the enzyme essential in platelets for the production of thromboxane A2, an important mediator of platelet aggregation and vasoconstriction), and its effects on the bleeding time, which persists for 12–15 days after aspirin is withdrawn. The other newer NSAIDs are reversible inactivators of cyclo-oxygenase, their effects lasting only as long as the drug remains in the circulation (Koch-Weser, 1980; Cronberg *et al.*, 1984). In vivo studies have shown that diclofenac does significantly increase the bleeding time, however not above the 'normal' upper limit (Power *et al.*, 1990).

This study was performed to determine whether the use of NSAIDs has an influence on the secondary haemorrhage rate post-tonsillectomy.

Method

A two-centre retrospective study was undertaken to determine if regular NSAIDs, given after discharge to tonsillectomy patients, caused an increase in secondary haemorrhage rate. Centre 'A' routinely prescribed NSAIDs at discharge, whereas centre 'B' rarely does.

A pilot study conducted showed an eight per cent difference in secondary haemorrhage rate between the two centres. Based on an $\alpha = 0.01$ and $\beta = 0.1$, sample size estimation showed a need for a total population of 500 for statistical validity.

The records of all tonsillectomy patients in a nine-month period were studied (adults and children) in both centres and the method of dissection, and

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TABLE I
RESULTS OF RETROSPECTIVE STUDY

	Centre A	Centre B	Total	Secondary Haem	% 2y Haem
Tonsillectomies	182	375	557		
Secondary haemorrhage	22	7	29		
	22/182 = 12%	7/375 = 1.9%	29/557 = 5.2%		
No. on NSAIDs	157	60	217	24	11.06% (24/217)
	157/182 = 86%	60/375 = 16%	217/557 = 39%		
No. not on NSAIDs	25	315	340	5	1.47% (5/340)
Bipolar dissection					
No. on NSAIDs	129	17	146	19	13.01% (19/146)
No. not on NSAIDs	16	93	109	3	2.75% (3/109)
Standard dissection					
No. on NSAIDs	28	43	71	5	7.04% (5.71)
No. not on NSAIDs	9	222	231	2	0.87% (2/231)
2y Haem on NSAIDs	20/22 = 91%	4/7 = 57%			

discharge prescription recorded. NSAIDs when prescribed were uniformly given as diclofenac 50 mg t.d.s. to adults, and ibuprofen to children in a dose of 20 mg/kg divided into three or four doses per 24 hours.

The same seven surgeons operated on all patients in the study period, two of whom operated at both sites.

Secondary haemorrhage was defined as any bleed occuring after 24 hours post-operatively. The policy in both centres was to admit all patients with a history of secondary haemorrhage for 24 hours. In this way all patients admitted with secondary haemorrhage who were operated on during the study period were recorded.

The data was entered onto a spreadsheet and analysed further using Chi Square 2 × 2 tables with Yates correction.

Results

The records of 557 patients were studied. Table I shows all the results obtained. No patient admitted with post-tonsillectomy secondary haemorrhage was excluded from the study group.

The overall secondary haemorrhage rate was 5.2 per cent (29/557), and this was significantly increased in those taking NSAIDs – 11 per cent (24/217) compared to those not taking NSAIDs 1.47 per cent (5/340) $\chi^2_1 = 41.25$, $p<0.001$.

Centre A had a 12 per cent (22) secondary haemorrhage rate, compared to centre B 1.9 per cent (seven), however 86 per cent of all tonsillectomy patients were taking regular NSAIDs in centre A, compared to only 16 per cent in centre B.

Twenty of the 22 secondary haemorrhages in centre A were taking NSAIDs (91 per cent). In centre B, four of the seven secondary haemorrhages were on NSAIDs, which is notable as only 60/375 (16 per cent) of the tonsillectomy patients were on NSAIDs. Hence in centre B four out of 60 patients on NSAIDs (6.7 per cent) had a secondary haemorrhage, compared with three out of 315 (0.95 per cent) not on NSAIDs.

With regards to dissection method, it can be seen that in both centres there is an increase in secondary haemorrhage in both dissection method groups (dissection and bipolar dissection) when given NSAIDs. The numbers in some of the sub-units of dissection method on and not on NSAIDs are small, and combining the groups from both centres would give a more statistically valid result (Table I).

With bipolar dissection a 19/146 (13.01 per cent) secondary haemorrhage rate on NSAIDs was observed, as compared with three out of 109 (2.75 per cent) not on NSAIDs, this difference being highly significant ($\chi^2_1 = 14.03$, $p<0.004$).

In the blunt dissection group the difference was less marked but still highly significant, with five out of 71 (7.04 per cent) secondary haemorrhage rate on NSAIDs compared with two out of 231 (0.87 per cent) not taking NSAIDs, $\chi^2_1 = 6.19$, $p<0.003$.

Although the rates of secondary haemorrhages with bipolar dissection were higher than with standard dissection for both those taking and not taking NSAIDs (13 per cent *vs* seven per cent and 2.75 per cent *vs* 0.87 per cent) this was not statistically significant ($\chi^2_1 = 1.17$, $p = 0.19$ and $\chi^2_1 = 0.773$, $p = 0.17$).

Discussion

The reported secondary haemorrhage rate for tonsillectomy is around one to two per cent (Carmody *et al.*, 1982; Shott *et al.*, 1987; Reiner *et al.*, 1990) looking at re-attendance, and higher 8.9 per cent, and 6.4 per cent (Maniglia *et al.*, 1989; Haberman *et al.*, 1990; Lee and Sharp, 1996) when patients are specifically asked about all minor and larger bleeding events post-discharge.

Our study, of 557 patients, found an overall much higher secondary haemorrhage rate of 11 per cent for those on NSAIDs, compared with a 1.47 per cent secondary haemorrhage rate for those not on NSAIDs. This highly significant increased secondary haemorrhage rate with NSAIDs is reflected in all sub-groups in the study, in each centre, individually and combined.

The increased secondary haemorrhage rate could be due to the fact that the minor bleeds, which have previously not re-attended, are now bleeding more due to the anti-platelet activity of the NSAIDs.

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The study was retrospective, however, there was no subjective interpretation of measures, as the information required was readily identifiable from the notes. The notes of all patients undergoing tonsillectomy in a defined nine-month period were obtained, except for seven patients' notes that could not be found, none of these had a secondary haemorrhage, and they were not included in the study.

The total of secondary haemorrhages (29) is small, however considering an 'accepted' rate of one to two per cent, this represents a relatively large number.

In centre A, we were concerned that the bipolar dissection method of tonsillectomy was responsible for the increased secondary haemorrhage rate. The results do show a higher secondary haemorrhage rate in the bipolar group compared to standard blunt dissection, however this was not statistically significant.

The most homogenous group to evaluate was the bipolar dissection group. All the four surgeons using the technique were taught it by one of the senior authors and performed it in the same way. Two surgeons operated at both sites. It is the bipolar dissection group that showed the greatest percentage difference in secondary haemorrhage rate between those on, and not on, regular post-operative NSAIDs (13 per cent *vs* 2.75 per cent ~10.25 per cent difference).

The standard dissection group was a little more heterogeneous, blunt dissection was used for all, but haemostasis was secured by ties, monopolar diathermy or both.

The confounding factors of different surgeons, diathermy machines and settings, and anaesthetic technique can rightly be forwarded, however these are probably more important factors in primary haemorrhage than secondary haemorrhage.

Ibuprofen was prescribed for children because of its easy availability from the pharmacy and low cost. Dispersible diclofenac was prescribed to adults. Although two different NSAIDs were used we felt able to combine the groups as they both have been shown to have similar reversible effects on platelet function (Koch-Weser, 1980; Reuter and Montgomery, 1984).

Our secondary haemorrhage rate (re-attendance) of 1.47 per cent for those not on NSAIDs is entirely consistent with those of previous large studies.

We are currently undertaking a larger prospective randomized controlled study to confirm these findings.

Conclusion

Whilst acknowledging the limitations of a retrospective study of this nature, we believe that the statistical power of the results certainly merit reporting, and further research of such a clinically relevant topic.

We conclude that prescription of regular NSAIDs at discharge for post-tonsillectomy patients may cause an increased secondary haemorrhage rate. Although NSAIDs are very good analgesics, they should be prescribed as a discharge prescription with caution.

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