

Effects Of Low-Dose Acetylsalicylic Acid (Baby Aspirin) On Post-Rhinoplasty Edema And Ecchymosis Reduction In Khatam-Al-Anbia Hospital Patients

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Abstract:

Introduction and goal: Similar to all the other operation, rhinoplasty is not devoid of side effects. Edema and ecchymosis are two common side effects of rhinoplasty and almost all the patients who undergo this operation experience them to a certain degree. Post-rhinoplasty ecchymosis can be mild or severe and can last for weeks to months. Non-steroidal anti-inflammatory drugs (NSAIDs) namely aspirin are able to control and alleviate tissue inflammation. Compared to common corticosteroid medicines, NSAIDs cause far fewer side effects. In the present study, we aimed to assess the effects of aspirin on post-rhinoplasty edema and ecchymosis.

Materials and methods: In this study all rhinoplasty candidate patients who were referred to Khatam-Al-Anbia hospital during 2016 and were willing to participate and also met the entrance criterion were studied. Two four-degree quality scales for edema and ecchymosis of each eyelid were used and the data were entered into a prepared checklist. Finally, SPSS ver. 22 software was used for data analysis.

Results: Average age of the study population was 27.22±7.98. Post-rhinoplasty edema on seventh post-operative day was (+1) for both studied groups. Furthermore, no significant relationship was found between the second and third post-operative days edemas in both groups. A significant relationship was found between drug therapy and ecchymosis on third (P=0.04) and seventh post-operative days (P=0.023). The least recorded ecchymosis belonged to the control group. The treatment group suffered from more severe ecchymosis.

Discussion and conclusion: No significant relationship was found between baby aspirin therapy and severity of edema. In addition, on two cases significant relationships were found between tissue ecchymosis and aspirin therapy, and compared to the control group, the treatment group suffered from more severe ecchymosis.

Keywords: Baby Aspirin, Edema, Ecchymosis, Rhinoplasty.

1. INTRODUCTION

Rhinoplasty is one of the most common and challenging and at the same time one the most precise, delicate and difficult plastic surgeries. Only a few surgeons have truly and completely mastered all the technical aspects of it (1-10). This surgery is performed due to functional and cosmetic reasons (6). Performing surgery on its own is not difficult, but surgical outcomes of this surgery can be exceptionally challenging and controversial (11).

Similar to all the other operation, rhinoplasty is not devoid of side effects and almost all the patients who undergo rhinoplasty experience edema and ecchymosis to some degree (1-10, 12-15). Depended on several factors including type and method of surgery and bruising susceptibility of patient, post-rhinoplasty ecchymosis can be mild or severe and can last for weeks or months. Post-operation edema

is the consequence of extracellular fluid accumulation at the surgical site which can cause pain and in severe cases may affect the final outcome of surgery. In a standard surgical procedure, angular vein damage and periosteum rupture during osteotomy cause periorbital ecchymosis and edema (4).

In order to control and prevent rhinoplasty swelling and bruising, various methods have been proposed. Some effective and practical methods for decreasing periorbital swelling and bruising include applying pressure on osteotomy site during the operation, taping the nose after operation, applying cold compress on nose and the surrounding areas, elevating head while sleeping and lying down and performing external or internal osteotomy. Based on previous studies, various drug therapies such as corticosteroid (namely Arnica) therapy have been proposed in order to reduce rhinoplasty bruising and swelling (2-9).

One of the possible drug therapies for control and prevention of rhinoplasty side effects is aspirin. Aspirin which is one of the salicylates has been used for a very long time and since the 1900s its therapeutic properties including its febrifugal, pain relieving and anti-inflammatory effects have been known (16). Non-steroidal anti-inflammatory drugs (NSAIDs) are one of the most commonly used drugs for relieving pain and inflammation. Humans have been using non-steroidal anti-inflammatory drug since 3500 BC. Nowadays, these drugs are used widely; firstly for relieving pain and secondly for treating inflammation, especially for treating rheumatoid arthritis. Aspirin, the first ever known NSAID, has been introduced as a medicine for more than a century and is still in use. Molecular mechanism of action of aspirin and other NSAIDs was understood for the first time in the 1970s, and it was then realized that these drugs execute their anti-inflammatory effects through irreversibly inactivating cyclooxygenase (COX) enzyme (3).

2. MATERIALS AND METHODS

This is a clinical trial and study population consisted of patients who underwent rhinoplasty in Khatam-al-anbyah hospital during 2016. Entrance criterion included having no history of NSAID hypersensitivity and exit criteria included hypersensitivity to NSAID namely aspirin, coagulation disorders, history of bleeding or ulcer, active infection or reluctance to participate. After understanding terms and conditions and reading and signing consent forms, the patients participated wittingly. Participants were randomly divided into two groups of treatment and control. Beginning from the second post-operative day, treatment group received 80 milligram aspirin pills (baby aspirins) for seven days and the control group did not receive any medications. On the third, fifth, seventh, tenth and fourteen post-operative days severity of swelling and bruising for each patient was evaluated using a 4-degree scale. For data analysis and comparison, Fisher's exact and Chi-square tests were used. Furthermore, 0.05 was designated as the significance level.

3. RESULTS

The average age of the studied population was (27.22±7.8) and they were divided into two treatment and control groups. Determination and comparison of the frequency of ecchymosis degrees in treatment and control groups was carried out. On the seventh post-rhinoplasty day, edema was found to be (+1) in both groups. No significant difference was found between the first and third post-operative days in the two groups. Edema degrees frequencies of the treatment and control groups on the first post-operative day are shown in table 1 and ecchymosis degrees frequencies of treatment and controls groups on the third post-operative day is shown in table 2.

Table 1: Edema degrees frequencies of the treatment and control groups on the first post-operative day

Degree edema	of	Treatment group	Control group	Total	<i>Fisher Exact Test p-value</i>
+1		(78.8%) 41	(69.2%) 36	(74%) 77	0.424
+2		(15.4%) 8	(23.1%) 12	(19.2%) 20	
+3		(3.8%) 2	(7.7%) 4	(5.8%) 6	
+4		(1.9%) 1	(0) 0	(1%) 1	

Total	(100%) 51	(100%) 52	(100%) 104	
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Table 2: Edema degrees frequencies of the treatment and control groups on the third post-operative day

Degree of edema	Treatment group	Control group	Total	Fisher Exact Test <i>p-value</i>
+1	(88.5%) 46	(90.4%) 47	(89.4%) 93	0.576
+2	(7.7%) 4	(9.6%) 5	(8.4%) 9	
+3	(3.8%) 2	(0) 0	(1.9%) 2	
+4	(0) 0	(0) 0	(0) 0	
Total	(100%) 52	(100%) 52	(100%) 104	

Ecchymosis frequencies comparison between treatment and control groups was also carried out, and a significant relationship was found between receiving baby aspirin and ecchymosis on the third (P=0.04) and seventh (P=0.23) post-operative days. The control group had the lowest ecchymosis. Upper and lower eyelid ecchymosis degrees results on the first, third and seventh post-operation days in both study groups are shown in tables 3 to 8.

Table 3: Upper eyelid ecchymosis degrees frequencies on the first post-operative day

Degree of ecchymosis	Treatment group	Control group	Total	Fisher's exact test <i>P-value</i>
+1	(57.7 %) 30	(65.4%) 34	(61.5%) 64	0.702
+2	(17.3%) 9	(17.3%) 9	(17.3%) 17	
+3	(9.6%) 5	(3.8%) 2	(6.7%) 7	
+4	(15.6%) 8	(13.5%) 7	(14.4%) 15	
Total	(100%) 52	(100%) 52	(100%) 104	

Table 4: Lower eyelid ecchymosis degrees frequencies in treatment and control groups on first post-operation day

Degree of ecchymosis	Treatment group	Control group	Total	Fisher's exact test <i>p-value</i>
+1	(0) 0	(0) 0	(0) 0	0.387
+2	(5.8%) 3	(9.6%) 5	(7.7%) 8	
+3	(19.2%) 10	(28.8%) 15	(24%) 25	
+4	(75%) 39	(61.5%) 32	(68.3%) 71	
Total	(100%) 52	(100%) 52	(100%) 104	

Table 5: Upper eyelid ecchymosis degrees frequencies in treatment and control groups on the third post-operative day

Degree of ecchymosis	Treatment group	Control group	Total	Chi-square <i>p-value</i>
+1	(50%) 26	(76.9%) 9	(63.5%) 66	0.04
+2	(30.8%) 16	(13.5%) 7	(22.1%) 23	
+3	(13.5%) 7	(5.8%) 3	(9.6%) 10	
+4	(5.8%) 3	(3.8%) 2	(4.8%) 5	
Total	(100%) 52	(100%) 52	(100%) 104	

Table 6: Lower eyelid ecchymosis degrees frequencies in treatment and control groups on the third post-operative day

Degree of ecchymosis	Treatment group	Control group	Total	Chi-square <i>p-value</i>
+1	(15.4%) 8	(23.1%) 12	(19.2%) 20	0.268
+2	(21.2%) 11	(32.7%) 17	(26.9%) 26	
+3	(46.2%) 24	(30.8%) 16	(38.5%) 40	
+4	(17.35%) 9	(13.5%) 7	(15.4%) 16	
Total	(100%) 52	(100%) 52	(100%) 104	

Table 7: Upper eyelid ecchymosis degrees frequencies in treatment and control groups on the seventh post-operative day

Degree of ecchymosis	Treatment group	Control group	Total	Fisher's exact test <i>p-value</i>
+1	(78.8%) 41	(96.2%) 50	(87.5%) 91	0.023
+2	(15.4%) 8	(3.8%) 2	(9.6%) 10	
+3	(3.8%) 2	(0) 0	(1.9%) 2	
+4	(1.9%) 1	(0) 0	(1%) 1	
Total	(100%) 52	(100%) 52	(100%) 104	

Table 8: Lower eyelid ecchymosis degrees frequencies in treatment and control groups on the seventh post-operative day

Degree of ecchymosis	Treatment group	Control group	Total	Chi-square <i>p-value</i>
+1	(46.2%) 24	(53.8%) 28	(50%) 52	0.083
+2	(36.5%) 19	(42.3%) 22	(39.4%) 41	
+3	(17.3%) 9	(3.8%) 2	(10.6%) 11	
+4	(0) 0	(0) 0	(0) 0	
Total	(100%) 52	(100%) 52	(100%) 104	

4. DISCUSSION

Edema and ecchymosis are two common side effects of face and jaw surgeries. In orthognathic surgeries and jaw traumas, compared to other problems that the patients face, this problem seems insignificant. But considering that rhinoplasty is done for functional or cosmetic reasons, edema and ecchymosis are major short-term concerns of patients (6). Therefore, surgeons actively seek methods for reducing these side effects and use various techniques to this end (1-10, 12-15); including pharmacological interventions and non-pharmacological interventions. Similar to the present research, As'habiyamin et al. (2016), who compared the effects of two sub-periosteal tunneling methods on creation of edema and ecchymosis, concluded that on the second and seventh post-operative days, there is no significant relationship between severity of periorbital edema and ecchymosis on each side of face (the side that had a sub-periosteal tunnel and the side which did not have a sub-periosteal tunnel) (17). In some other studies it was indicted that these tunnels increase post-rhinoplasty edema and ecchymosis (5-8). On the contrary, some other studies have indicated that these tunnels decrease periorbital edema and ecchymosis (18). In a similar study, Jahromi et al. (2006) compared external and internal lateral osteotomies in terms of decreasing post-rhinoplasty edema and ecchymosis. Their results indicated that neither external nor internal osteotomies affect post-rhinoplasty edema, and on the second post-operative day ecchymosis was significantly lower in patients who had internal lateral osteotomies (14). Comparably Asadi et al. (2013), who compared the effects of closed drainage system on edema and ecchymosis following rhinoplasty, concluded that closed drainage systems results in significant reduction in eyelid ecchymosis on the fourteenth post-operative day and also effectively reduces para-nasal areas and cheeks ecchymosis on the seventh and fourteenth post-operative days. Drainage tube did not significantly reduce the supra-tip and eyelid edemas (19). Steroid and non-steroid medicines such as arnica and aspirin are constantly being used in order to

reduce post-operative side effects (2-9). The study population of the present study had an average age of (27.22 ± 7.08) and no significant difference was found between taking medication and edema in them. Several studies have shown that non-steroidal anti-inflammatory drugs can reduce edemas of some tissues. For instance Offret et al. (2007), who evaluated the effects of non-steroidal anti-inflammatory drugs on corneal edema, concluded that systematic use of non-steroidal anti-inflammatory drugs can lead to the reduction of corneal edema (20). This study was not similar to our study. Skjelbred et al. (1984), who investigated post-operative severity of edema after taking non-steroidal anti-inflammatory drugs, stated that low doses of aspirin after operation can increase tissue edema. Meanwhile, high doses of aspirin were shown to significantly decrease tissue edema (21). This study does not agree with our study. In another study, Skjelbred et al. (1993), who investigated the effects of aspirin on tissue damages, showed that acetaminophen significantly reduces post-operative edema and pain, while aspirin does not affect severity of edema (22). That study agrees with the present study. Considering all these results and researches, it can be concluded that designated dosage of aspirin in this study was not the maximum allowed daily dose and treatment group had received analgesic doses of aspirin. Although this dosage of aspirin is not effective in reducing post-operative edema, but it can be used for treating joint swellings of rheumatic patients in long terms.

In the present study, a significant relationship was found between treatment and control groups on the third ($P= 0.04$) and the seventh ($P=0.023$) post-operative days and the control group had the lowest ecchymosis severity; the treatment group suffered from more severe ecchymosis. Chen & Dragoo (2013), who studied effects of non-steroidal anti-inflammatory drugs on wound healing, stated that these drugs in low doses and short terms (2 to 8 days) have no effects on soft tissue wound healing, while they are useful for osseous tissue healing (23). That study is similar to our study. Meanwhile, in another study about useful medicines for wound healing, non-steroidal anti-inflammatory drugs were also mentioned and some benefits of them in this regard were listed (13). Zitelli (1987), who studies wound healing processes, indicated that corticosteroid drugs are the most effective and appropriate drugs for reducing tissues bruising, but aspirin and the other non-steroidal anti-inflammatory drugs due to their antiplatelet effects, do not reduce ecchymosis and are unable to speed up wound healing and therefore their post-operative usage is not advisable (24). This study is consistent with the present study. Using the lowest possible dose of aspirin in the present study and the antiplatelet properties of this drug, may explain the observed increased tissue ecchymosis or its ineffectiveness in reducing ecchymosis. The important role of platelets in wound healing is well known, and by deactivating platelets, non-steroidal anti-inflammatory drugs hinder ecchymosis healing. In a similar study, Totonchi & Guyuron (2007), compared the effects of arnica and other corticosteroids on post – rhinoplasty edema and ecchymosis and concluded that in addition to corticosteroids such as tranexamic acid, arnica also can reduce post-operative edema and no significant difference was found between their effectiveness (25). Tranexamic acid and dexamethasone are two corticosteroid drugs and Jalali et al. (2012) compared their effects on reducing post-operative edema and ecchymosis. Their results indicated that the two drugs are similarly effective in this regard and drug selection should be based on their other properties and side effects (7). Multiple studies have been done in order to evaluate the effects of dexamethasone on post-rhinoplasty edema and ecchymosis (4, 12, 26), and they all have shown the positive effects of this drug, but it must be noted that long-term use of glucocorticoids could lead to serious side effects.

5. FINAL CONCLUSION

At the present study, no significant relationship was found between severity of tissue edema and taking baby aspirin. Moreover, in two occasions a significant relationship was found between ecchymosis and taking aspirin and the treatment group experienced more severe ecchymosis compared to the control group.

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