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Research letter

Acute pain intensity in men and women after septoplasty

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Abstract: Acute pain in the initial period after surgery on cartilaginous part of the nasal septum was studied. It is shown that the pain level was significantly higher in women than in men (P<0.01). It is concluded that gender should be taken account of in pain relief strategy after this type of surgery.

Keywords: gender, pain syndrome, analogue pain scales

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Introduction

Problem of pain assessment widely discussed in abdominal surgery, traumatology, orthopedics etc [1-5]. Recently this point calls for consideration in otolaryngology, particularly in nasal cavity surgery [6-10].

Pain intesity depends on multiple factors and frequently had subjective nature [11]. Age, sex, social and cultural background and so forth are among those factors [12, 13].

For example, women are more sensible to pain stimuli and take pain more seriously than men [13]. Considering sex factor, there are some difficulties in estimation of average pain level of a group consisted of male and female patients. But self-assessment is more important than group pain level.

Common methods of pain estimation are Visual Analogue Scale (VAS) [8, 14, 15], Numeric Rating Scale (NRS) [16-18], McGill pain index [19, 20], etc. Likert scales are used for nasal symptoms (crusting, bleeding, sneezing, secretion, and nasal pain). In rhinology VAS [10, 22] or NRS [23] are basically applied for pain and discomfort level measurement during anterior nasal packing and so on. And there are no significant attempts to use another modification of pain intensity procedures to improve pain diagnostics after septoplasty.

It is hard to overrate the importance of diagnostics of pain in patients after septum surgery. So, it is recommended to administer one of analgesic ladder drugs (e.g. non-steroidal anti-inflammatory drugs) to patients with 0 to 29 mm of VAS pain level. If there is a case of 30 to 59 mm one or two ladder drugs should be prescribed such as weak opioid (e.g. codeine, dihydrocodeine or tramadol). Patients with pain of 60 to 100 mm should take three analgesics including strong opioids (e.g. s morphine, fentanyl, buprenorphine, methadon) [24]. Estimation of such analgesic therapy is of great importance.

We didn't find up to date data on thorough analysis of pain intensity distribution of patient in otolaryngology especially concerning sex differences.

The study was aimed at characterization of pain level distribution in men and women after septoplasty and development and testing of a new sex-specific pain scale.

Material and Methods

Acute pain syndrome was investigated in patients with nasal septum deviation after septoplasty. 46 men aged from 16 to 44 and 36 women aged from 20 to 37 were operated on (*Table* 1). Septoplasty was conducted under topical anesthesia by 2% lidocaine solution and infiltration anesthesia by 5% procaine solution. Patients after surgery on cartilaginous part of the nasal septum only was included since surgical field size and vegetative nervous system activation affect postoperative pain intensity [25].

Right after surgery anterior nasal packing with Laevomecolum ointment was performed.

Table 1. Clinicodemographic description of patient with nasal septum deviation

	Men	*Women*
Quantity, no.	46	36
Mean age, years, M±SD	30.0±14.0	28,5±8,5
Location of the nasal septum deviation	Cartilaginous part of the nasal septum	
Type of anesthesia	Topical anesthesia by 2% lidocaine solution and infiltration anesthesia by 5% procaine solution	

M±SD, mean with standard deviation.

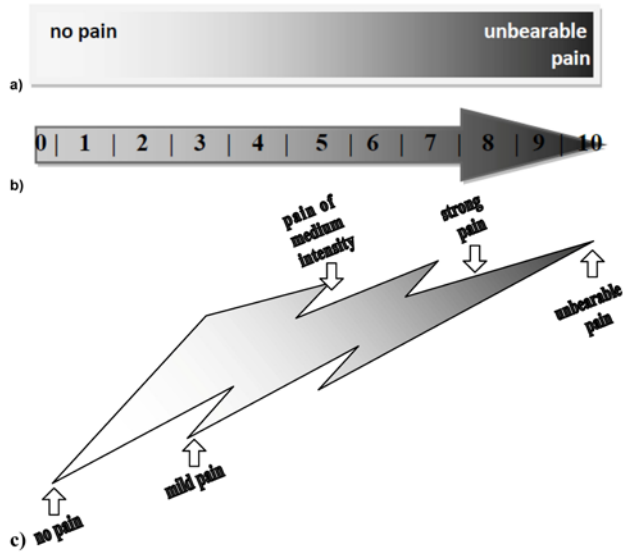

Figure 1. Pain scales: a – Visual Analogue Scale, b – Numeric Rating Scale, c – Verbal "Lightning" Scale.

Pain intensity was measured by means of three pain scales: VAS [8], NRS [26] and Verbal "Lightning" Scale (VLS) (*Figure* 1). VLS was proposed by our research group for pain syndrome assessment. Intensity of pain was registered in millimeters in two hours after surgery. Our modifications of pain scales were used [27] (*Figure* 1). Patients were divided into following subgroups: with no or weak pain (0-25 mm), with moderate pain (26-50 mm), with strong pain (51-75 mm), and very strong pain (76-100 mm). Our VLS unlike common pain scales is no rectilinear. Its horizontal projection length is 100 mm. And it had broadened set of verbal pain descriptors ("no pain", "mild pain", "moderate pain", "strong pain", "severe pain") (*Figure* 1c). While assessing pain by VLS patient draw a vertical line crossing scale where s/he think it's right place to reflect his/her sensation of pain. Pain level measured by VLS is the length of the part of VLS cut off by vertical line projected to millimeter scale under VLS. Data obtained by VLS were compared to those on VAS and NRS.

Significance of mean values differences was determined by Student's t-test. Linear regressions for VLS-VAS and VLS-NRS pairs were studied.

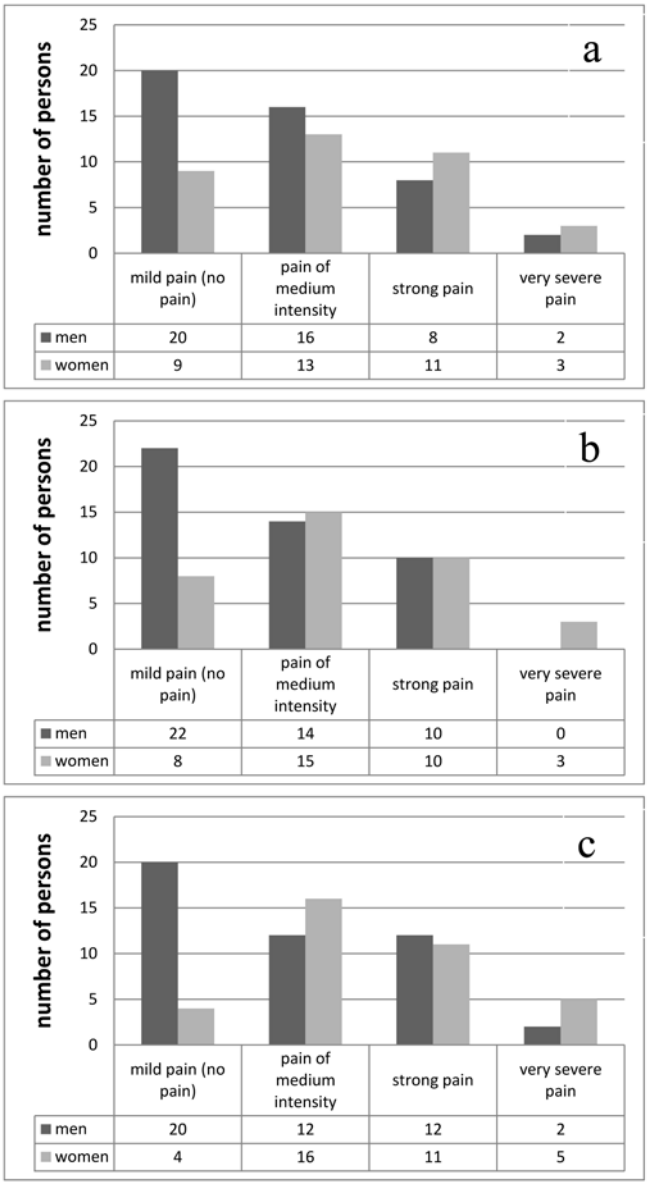

Figure 2. Pain intensity distribution in men and women: a – VAS; b – NRS; c – VLS.

Results

According to average pain level values in 2 hours after septoplasty men were distributed as folows: 39.1% had no or mild pain, 39.1% had moderate pain, 21,7% had strong pain, no patient had severe pain (*Figure* 2).

8.3% of women described their pain as severe, 33.3% had strong pain, and 47.2% had moderate pain. As opposed to men, 11.1% of women only had no or mild pain during first hours after operation.

Comparison of the scales revealed no significant discrepancy. So, 43.5%, 47.8% and 43.5% of men marked their pain as mild by VAS, NRS, and VLS accordingly (*Figure* 3). Moderate pain was observed in 34.8% by VAS, in 30.4% by NRS, and in 26.1% by VLS. 17.4 by VAS, 21.7% by NRS, and 26.1% by VLS of men suffered strong pain. Severe pain was experienced by 4.3% (VAS), 0% (NRS), and 4.4% (VLS) of men.

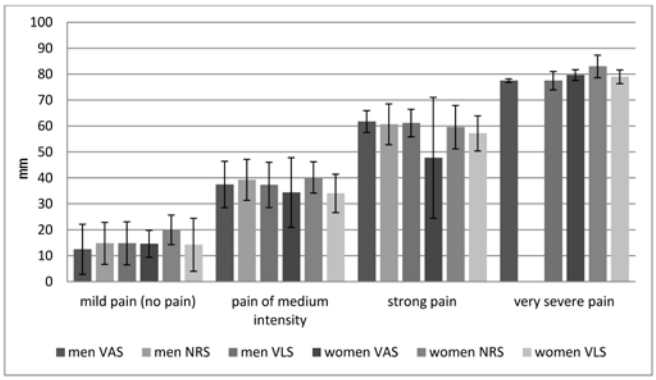

Figure 3. Mean pain level values in subgroups and by scales (M±SE).

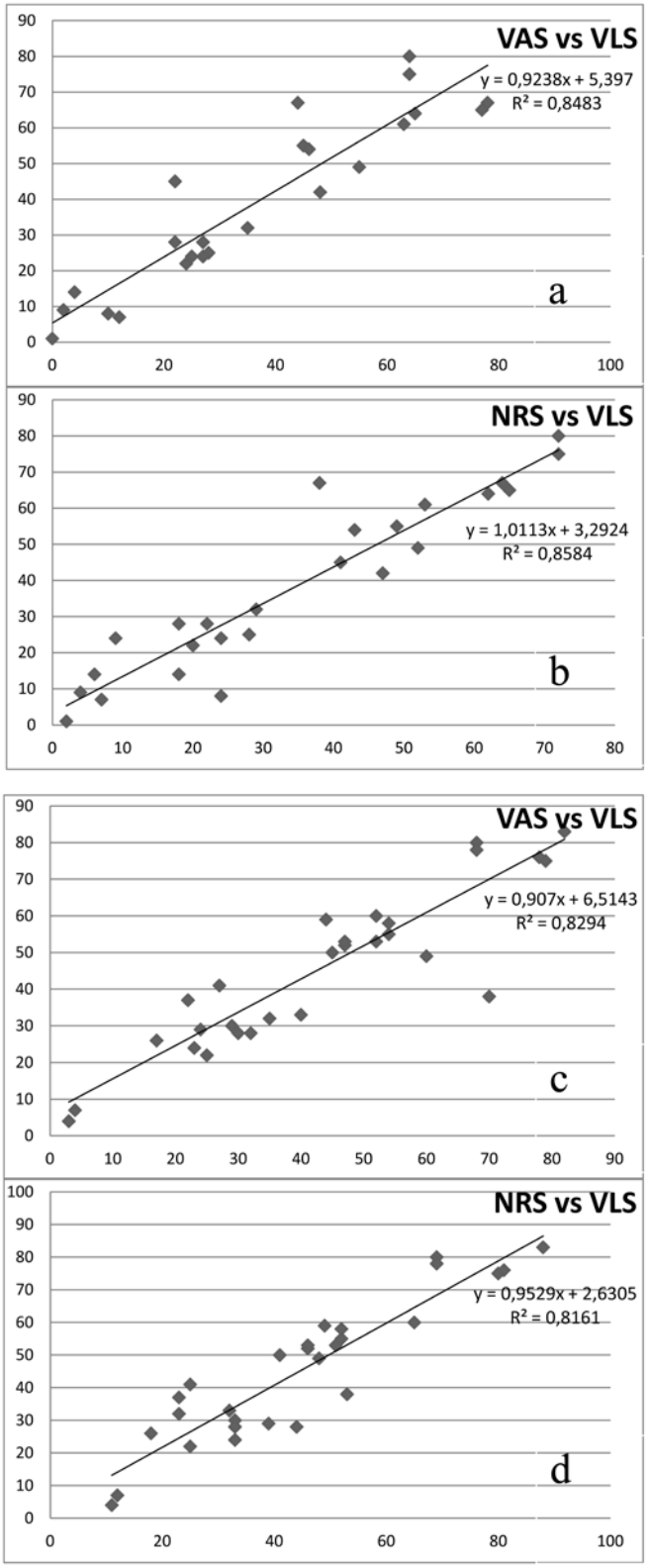

Figure 4. Linear regression of VAS, NSR & VLS data sets in men (a, b) and women (c, d).

25%, 22.2%, 11.1% of women had no or mild pain according to VAS, NRS, VLS accordingly. Moderate pain was in 36.1% (VAS), 41.7% (NRS), and 44.4% (VLS) of women. Strong pain was diagnosed in 30.6% (VAS; *Figure* 2a), 27.8% (NRS; *Figure* 2b), and 30.6% (VLS; *Figure* 2c) of women. In contrast with men, more women feel severe pain: 8.3% (VAS, NRS) and 13.9 (VLS).

When distributing into pan level subgroups it was found that in mild pain women group average NRS pain level (20±5.7 mm) was significantly higher (P<0.05) than that measured by VLS (14.3±10.2 mm). The same thing was observed for women with moderate pain 40.2±6.09 mm (NRS) against 34.1±7.4 mm (VLS) (P<0.05). VAS average pain level for women with strong pain was lower but standard deviation was higher 47.8±23.3 (P<0.05) while NRS and VLS pain intensity had no differences.

Strong pain only was diagnosed in men by means of VAS and VLS with no prominent difference in mean values which was also found for women (*Figure* 3).

Linear regression analysis showed that coefficient of determination between VAS and VLS values for men was 0.84 (*Figure* 4a) and between NRS and VLS values was 0.85 (*Figure* 4b). The same procedure for women yielded 0.83 and 0.81 accordingly (*Figure* 4c-d).

Discussion

Gauze packs were used for anterior nasal packing in both groups. Gauze packs are believed to reduce the risk of postoperative complications such as bleeding, haematomas, and nasal adhesions. Though there is not enough evidence displaying clear advantage of gauze packs after septoplasty [28]. On the contrary, postoperative packing caused discomfort, pain, infectious complications and stuffiness in nose which may have worsened concomitant disorders such as .obstructive sleep apnea. There is additional potential risk of pack displacement and aspiration. In randomized trial trans-septal suturing was compared versus nasal packing. Patients with trans-septal suturing suffered less postoperative complications including pain and discomfort [29]. Furthermore, systematic review of 7 randomised controlled trials with the participation of 869 patients where trans-septal suturing was compared to nasal packing showed nasal ache and headache were significantly less in trans-septal suturing case while postoperative complications including bleeding, haematoma, nasal adhesion, septal perforation and local infectious complications had no intergroup differences [22]. Having regard to these data it might be concluded that trans-septal suturing allowed to avoid the need for nasal packing after septoplasty and hence to avoid nasal pain, discomfort and other risks of nasal packing [30]. We didn't observe any complications during 3 days nasal packing. But it cannot be excluded that intensity of pain was connected to nasal packing.

Most of men got into groups for milld and moderate pain while most of women found themselves in groups for moderate and strong pain. Average pain intensity values were 14.0±8.7 for men with mild pain, 38.0±8.5 for men with moderate pain, 36.2±9.0 for women with moderate pain, 58.9±12.8 for women with strong pain. D. Malki et al. and I. Cukurova et al. reported 2.2 and 4.8 out of 10 pain intensities during the first day after septoplasty [31, 32] measured by VAS. But they didn't note any statistically prominent difference between anterior packing, septal suturing and splint. M.S. Awan & M. Iqbal [33] compared nasal packs versus septal suturing. They concluded that packing led to stronger pain (7.32 out of 10). M.M. Ardehali & S. Bastaninejad and J.A. Cook et al. communicated that anterior nasal packing caused pain of 5.0 and 4.8 which corresponded to our 50 and 48 mm values [34, 35]. O. Gunaydin et al., T.E. Habesoglu et al., D.A. Nunez & F.W. Martin

showed folowing first day after septoplasty with anterior packing pain intensity values: 5.9, 6.09 and 4.1 [28, 36, 37]. Almost all authors point out that nasal packing leads to more pronounced pain syndrome than nasal suturing and splints [38]. Merocel Yilmaz M.S. et al. recounted 6±2.21 out of 10 [39] and A.K. Amin et al. told of 27±9.52 out of 100 pain intensity in patients after septoplasty with nasal packing [40]. All studies data were in accordance with our results.

Comparing two data sets (data on pain scales, in our case) by using of linear regression is possible only if the data set fulfill three requirements. First one is scatter plot of the values for two variables should show linear association. Second one is scatter of the points in the scatter plot around the line should be similar throughout the length of the line. Third one is residuals of the points in the scatter plot meaning the difference between the expected points and observed points should have a normal distribution [41]. Our data satisfied these conditions.

It should be noted that in our study women showed stronger pain level using NRS. On the contrary, pain intensity values measured by NRS for men were lower than those measured by other scales. M.A. Ferreira-Valente et al. study confirms this observation. Authors studied nociception applying cold and concluded that NRS was more gender sensitive and specific than VAS and verbal scale [42]. J.F.M. van Dijk et al. [43] revealed that “bearable pain” didn’t mean the same for men and women. Women reported higher NRS values for “bearable pain” than men. Significantly more women than men considered NRS 5, 6 and 7 to be ‘painful but bearable’. Women reported more postoperative pain than men, but more women considered intermediate NRS scores as ‘bearable pain’. This finding should be taken into account in treatment decisions and guideline development.

Gender for analgesia is considered as pain predictor. Some studies discovered positive relation between female sex and postoperative pain syndrome [12, 44-46]. Also, positive correlation between female sex and amount of analgesic during postoperative period was shown [11, 44]. But Y.Y. Chia et al. demonstrated negative relation of sex to analgesia [47]. On the other hand, three studies didn’t observe significant correlation between sex and postoperative pain [48-50] and one study didn’t found relation between sex and need for analgesia [51]. H.Y.V. Ip et al. believe sex is not postoperative pain predictor [52]. L. Li et al. didn’t find considerable difference in postoperative pain in men and women [53]. Though L. Gagliese et al. exposed significantly higher level of postoperative pain in female patients using patient-controlled analgesia [46]. J.D. Greenspan et al. and K.J. Berkley studied this controversy as more complex phenomenon related to gender, anatomy and hormone features [54, 55]. They concluded that differences in pain sensibility could not be accurately predicted.

According to our results, after surgery on cartilaginous part of the nasal septum women suffer greater pain than men. But these results are probably irrelevant in the case of osseous part since it is known that there is diffuse vegetative Zazybin ganglion there which may cause various vegetative reactions [25]. This is confirmed by G.S. Özler study where two groups of patients with osseous and cartilaginous parts deviation were examined. Patient after surgery on osseous part felt stronger pain on postoperative 1, 3 and 7 day than those after surgery on cartilaginous part [7].

Gender apparently cannot be the independent predictor for postoperative pain or for planning postoperative analgesia. Data on sex differences for pain perception and analgesic intake remain tentative and age can make difficulties in pain prediction. The mechanism for gender differences is still elusive [52]. There is some evidence that genetics plays a part in influencing interindividual variation in clinical and experimental pain responses [57]. It can also be attributed to a different socialization processes for men and women that influence bodily experience and the willingness to communicate distress [46]. Hormone variations [58], neurotransmitters that can influence patient perception of pain, and pharmacokinetic variations may also occur [57].

Hence, there are some open questions for analgesia in rhinology: is there a correlation between postoperative analgesic intake and sex? What features has pain when operative area includes whole septum? Does pain depends on sex and packing type in this case?

Conclusion

Our study showed that postoperative pain during initial period after surgery on cartilaginous part of the nasal septum significantly higher in women than in men. This allows considering sex as predictor for pain intensity in this type of surgery and for planning postoperative analgesia. VAS and VLS can be used regardless of sex for pain assessment after septoplasty. As for NRS, it should be taken into account that women mark higher NRS pain level as compared to VAS and VLS.

Conflict of interest

No conflict of interest

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