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Ornipressin as vasoconstrictor in rhinosurgery

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SUMMARY

The haemostatic effect of a high concentration of ornipressin 5 IU/10 mls lidocaine was studied in 127 patients undergoing rhinosurgery under two types of general anaesthesia.

Under halothane/enflurane anaesthesia blood pressure and heart rate remained nearly constant up to 15 minutes following local injection of ornipressin into the nasal tissues. Good haemostasis was achieved in 86.5 percent of cases.

Under diazepam/fentanyl anaesthesia an elevation of blood pressure was observed following infiltration of ornipressin. Thus the high concentration cannot be recommended for cases with blood pressure dyscrasias. The haemostatic effect was either good in only 60 percent of the patients.

INTRODUCTION

Under general anaesthesia the use of adrenaline or noradrenaline used as a vasoconstrictor for topical infiltration is potentially dangerous because of the unwanted side-effects on the cardiovascular system. Ornipressin (ornithin^{8}-vasopressin; POR 8®/Sandoz) was therefore introduced in 1963 as an alternative vasoconstrictor and it has been demonstrated by several authors (Ackermann et al., 1969; Neiger, 1969; Münker, 1973; Rintala, 1968), that this new vasoconstrictive polypeptide has no markedly negative effects on blood pressure and heart rate. The well known pharmacological properties of this haemostatic substance have been extensively investigated in other studies (Kamp, 1974; Klingenström et al., 1967; Mattes et al., 1969).

At the recommended concentration of 1 IU ornipressin in 10 mls local anaesthetic the haemostatic effect during rhinosurgery is unsatisfactory however. Some authors therefore have administered the vasoconstrictor in a higher dose, up to 1.7 IU/10 mls and used larger quantities of this solution during rhinosurgery (Table 1).

We found that haemostasis was still unsufficient at such increased doses and, that larger amounts of the infiltrated solution disturb the contour of the nose. Hence we increased the dose to 5 IU ornipressin in 10 mls local anaesthetic and obtained good vasoconstriction during rhinosurgery.

Table 1. Concentration and total doses of ornipressin by different authors during ENT surgery.

author	type of surgery	concentration IU/10 mls	total dose IU
Hibler, N.	tonsillectomy septoplasty Caldwell-Luc	1.7	3.3–4.1
Klingenström, B. et al.	rhinoplasty skin-plasty tumors	1.7	0.85–3.4
Marti, H. R.	tonsillectomy septoplasty Caldwell-Luc tympanoplasty	1.0	2.0–3.0
Neiger, M.	septoplasty Caldwell-Luc tympanoplasty	1.5	
own study	rhinosurgery	5.0	3.2

METHOD

Topical decongestion of the nasal mucosa is obtained by the application of long-fibred cotton-swabs drained with saline solution containing 0.5 percent of tramazoline (Ellatun®) into the nasal cavities. For infiltration of the nasal structures we used 6–8 mls lidocaine, containing ornipressin at a concentration of 5 IU/10 mls lidocaine.

For septoplasties this solution was infiltrated between the medial crura, the base of the nose and the maxillary spine area. In addition, the nasal mucoperiostium around both incisive foramina was infiltrated as were the mucoperiostial flaps covering the vomeral spur. For rhinoplasties, we also infiltrated the alar folds, the skin along the naso-optic groove, and the skin of the cul-de-sac. Ten minutes are allowed to elapse the first incision is made. Haemostasis starts to decrease after 60 minutes and is no longer present 120 minutes after injection.

RESULTS

First we compared in a double-blind study of 30 patients undergoing rhinoplasty the haemostatic effect of two solutions of lidocaine with ornipressin, at a concentration of 1.5 IU/10 mls and 5 IU/10 mls. The results are summarized in Table 2. The subjective impressions of the surgeon as to the vasoconstrictor effect, classified as good, medium or bad, were only slightly in favour of the higher concentration of ornipressin. Significantly different was the objective finding of a higher blood loss, namely nearly threefold, during rhinoplasty using the lower concen-

Table 2. The haemostatic effect of ornipressin in a double-blind-study using two different concentrations of the vasoconstrictor.

haemostatic effect	group A (n = 15) 1.5 IU ornipressin/ 10 mls lidocaine	group B (N = 15) 5 IU ornipressin/ 10 mls lidocaine
total dose of ornipressin	1.12 IU	3.25 IU
surgeon's opinion of haemostasis: good	7	8
medium	2	5
bad	5	1
blood loss	115 mls	37 mls

tration of ornipressin. In this first study, the influence of the type of anaesthesia, which is also important with respect to haemostasis, was not assessed.
The main aim of the next study on 97 patients undergoing functional rhinoplasty was to find out if there is any effect on blood pressure and heart rate using the increased dose of 5 IU/10 mls of ornipressin under the two types of general anaesthesia. Blood pressure and heart rate were registered before infiltration of the vasoconstrictor solution, and then 5, 10 and 15 minutes later. This local injection started approximately 11 minutes after intubation.
General anaesthesia was performed with halothane (Fluothane®) or enflurane (Ethrane®) in 52 patients and with diazepam/fentanyl (Valium®) in 45 patients. The influence of the vasoconstrictor ornipressin on blood pressure and heart rate is summarized in Figures 1 and 2. Under anaesthesia with halothane/enflurane the infiltration of the nasal tissues with ornipressin is without marked side-effects on the cardio-vascular system (Figure 1), whereas there is a slight elevation of

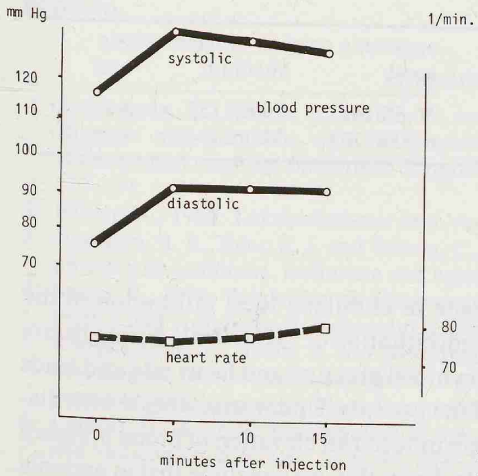

Figure 1. Mean values of blood pressure and heart rate after infiltration with ornipressin under general anaesthesia with halothane/enflurane (n = 52).

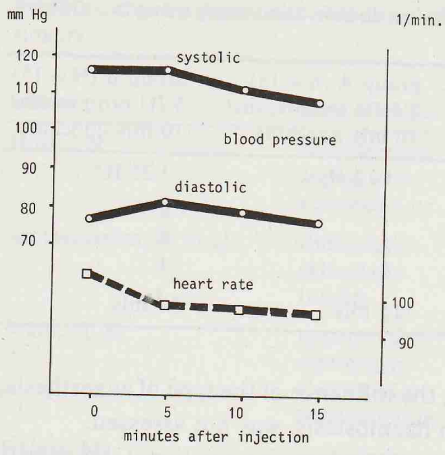

Figure 2. Mean values of blood pressure and heart rate after infiltration with ornipressin under general anaesthesia with diazepam/fentanyl (n = 45).

systolic and diastolic blood pressure under general anaesthesia with diazepam/fentanyl. The lower heart rate level in the diazepam/fentanyl group is caused by the anaesthetic. In neither group could disturbances of cardiac rhythm which was assessed by continuous ECG monitoring be observed.

The haemostatic influence of ornipressin in the two groups of patients is summarized in Table 3. Although the diazepam/fentanyl group had a slightly higher total dose (0.5 IU), the haemostasis was considered to be better in the group given halothane/enflurane anaesthesia (86.5 percent good results) compared to the diazepam/fentanyl group (60 percent good results).

Table 3. Surgeon's opinion of the haemostatic effects of ornipressin under two types of general anaesthesia.

	surgeon's opinion of haemostasis		
	good	medium	bad
halothane-/enflurane-anaesthesia (n = 52)	86.5% (45)	9.6% (5)	3.9% (2)
diazepam-/fentanyl-anaesthesia (n = 45)	60.0% (27)	31.1% (14)	8.9% (4)

DISCUSSION

Under general anaesthesia with halothane or enflurane local infiltration of the nasal tissues with ornipressin in a high concentration of 5 IU/10 mls during rhinosurgery is without marked side-effects on blood pressure and heart rate and leads to a good haemostasis in 86.5 percent of the patients. Under anaesthesia with diazepam/fentanyl infiltration of ornipressin induced an elevation of blood pressure while there was no influence on heart rate. From this, we conclude that in patients

in whom an increase of blood pressure is undesirable a general anaesthesia under halothane is to be preferred, or else, it is not wise to use ornipressin at the high concentration of 5 IU/10 mls lidocaine.

Another disadvantage of the diazepam/fentanyl anaesthesia is that the haemostasis of the nasal tissues is not as good (60 percent) as that under anaesthesia with halothane (86.5 percent) although the average total dose of ornipressin was slightly higher in the diazepam/fentanyl group (Table 3).

Thus, the use of ornipressin at high concentration under halothane or enflurane anaesthesia is a realistic alternative to the use of adrenaline, which is especially contraindicated in halothane anaesthesia. Comparing our results to those of other authors who used a lower concentration of ornipressin there are no differences as to the application of total dose of ornipressin as can be read from Table 1. The advantage of using a high concentration and a small amount of the haemostatic solution, especially in rhinosurgery, is that the nasal contours are not altered by the infiltration of too great a volume of solution.

ZUSAMMENFASSUNG

Bei 127 Patienten wurde in Abhängigkeit von zwei Narkoseformen der hämostatische Effekt einer mit 5 IE/10 ml Lidocain hochkonzentrierten Ornipressinlösung bei Rhinoplastiken untersucht.

Bei Halothan-/Ethrane-Narkosen blieben Blutdruck und Puls im untersuchten Zeitraum bis 15 Minuten nach der Infiltration mit Ornipressin nahezu konstant. Der hämostatische Effekt wurde in 86,5% der Fälle mit gut beurteilt.

Dagegen trat nach nasaler Ornipressininfiltration unter Diazepam-/Fentanyl-Narkosen ein merklicher Anstieg des systolischen und diastolischen Blutdrucks auf. Es sollte daher bei Patienten, bei denen ein Blutdruckanstieg unerwünscht ist, nicht eingesetzt werden. Eine gute Hämostase wurde nur in 60% der Fälle angegeben.

REFERENCES

1. Ackermann, U., Foitzik, H., Höltje, W. and Lawin, P., 1969: Vergleichende Untersuchungen mit Adrenalin und Octapressinzusatz zum Lokalanästhetikum während Halothannarkosen bei operativen Eingriffen im HNO-Bereich. Z. prakt, Anästh. 3, 119–131.
2. Hibler, N., 1968: Lokalanästhesis und Vasoconstrictor. HNO 16, 343–346.
3. Johnston, R. R., Eger, E. I. and Wilson, C., 1976: A comparative interaction of epinephrine with enflurane, isoflurane and halothane in man. Anesth. Analg. 55, 790–712.
4. Kamp, R., 1974: Vergleichende Untersuchungen über die blutstillende Wirkung von POR 8 und Adrenalin-Noradrenalin. Laryng. Rhinol. 53, 570–576.
5. Klingenström, P., Nylén, B. and Westermark, L., 1967: Experimental and clinical investigations of the local vasoconstrictive effect of two new derivatives of pituitary posterior lobe hormones. Plast. Reconst. Surg. 39, 503–511.
6. Lindorf, H. H., 1979: Investigation of the vascular effect of newer local anaesthetics and vasoconstrictors. Oral Surg. 48, 292–297.

7. Marti, H. R., 1968: Klinische Prüfung eines neuen Vasokonstriktors (POR 8) als Zusatz zur LA bei Eingriffen im ORL-Bereich. Pract. oto-rhino-laryng. 30, 370–376.
8. Mattes, H., Andree, G. and Neumann, R., 1969: Klinische Beobachtungen bei der Anwendung eines neuen Vasokonstriktors: Ornithin-Vasopressin (POR 8). Z. prakt. Anästh. 3, 132–139.
9. Münker, G., 1973: Ornithin^8-Vasopressin (POR 8) als vasokonstriktorischer Zusatz zur Lokalanästhesie bei Tonsillektomien. Mschr. Ohrenheilk. 7, 289–296.
10. Neiger, M., 1969: Klinischer Versuch mit POR 8 (Purantix®/Sandoz) als Vasokonstriktor. Sein Einfluß auf Blutdruck und Pulsfrequenz. Pract. oto-rhino-laryng. 31, 246–253.
11. Rintala, A., 1968: Haemostatic effect of ornitine^8-vasopressin on operative bleeding. Acta anaesth. Scand. 12, 89–94.
12. Siegel, R. J., Vistnes, L. M., Iverson, R. E., 1973: Effective hemostasis with less epinephrine – An experimental and clinical study. Plast. Reconstr. Surg. 51, 129–133.
13. Wayoff, M., Moeller, R. and Savonnière, C., 1973: Anesthesia in rhinosurgery. Rhinol. 11, 23–28.

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