

Bradycardia as a side-effect to oxybuprocaine

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Sinus bradycardia was observed as a side-effect to the use of 0.4% oxybuprocaine eye-drops in a 48-year-old man with acute conjunctivitis. Blood pressure was not measurable during the episode.

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Oxybuprocaine hydrochloride is a synthetic derivate of p-aminobenzoic acid and has intense local analgesic activity on mucous membranes. It is used principally for conjunctival analgesia. Its activity is 10 times that of cocaine and twice that of amethocaine, while its therapeutic ratio is three times as great as cocaine, twice that of amethocaine and 36 times that of procaine. Oxybuprocaine is less irritant to the conjunctiva than amethocaine in similar concentrations. One drop of 0.4% solution is sufficient to render the conjunctiva anaesthetised. It has a short duration of action. Its principal uses are for tonometry of the eye and for fitting contact lenses (1).

CASE REPORT

A 48-year-old man, who had previously been healthy and without cardiac complaints and was taking no medication, was admitted to the casualty ward because of acute conjunctivitis which appeared in connection with welding without the use of welders' goggles.

He was treated with 1 drop of 0.4% oxybuprocaine in each eye. On admission, blood pressure was 130/60 mmHg (17.3/8.0 kPa), and pulse rate was 80 beats per minute, regular. Five minutes after the administration of the eye drops, the patient became cold, and was sweating and unconscious with snoring respiration and without any perceptible peripheral pulse. Cardiopulmonary resuscitation was instituted with external cardiac compression and ventilation by mask with pure oxygen. Electrocardiography revealed a sinus bradycardia with 25 beats per minute, which, before atropine could be administered, spontaneously increased to 55 beats per min, and 5 min later to the initial value of 80 beats per min. The patient now appeared well, with a blood pressure of 130/60 mmHg (17.3/8.0 kPa). Apart from sinus bradycardia, electrocardiography with 9 leads was normal.

He was observed in the coronary unit for the next 36 h, but nothing abnormal occurred, apart from a short period of sinus bradycardia, 16 beats per min, a few minutes after admission to the coronary care unit. He improved spontaneously to initial values of blood pressure and pulse rate.

The time lag between the two episodes of sinus bradycardia was about 30 min. During this period there was no manipulation of the patient or his eyes which could provoke a vagus effect. He was discharged from the department in a healthy state. In a follow-up period of 10 months through his general practitioner, he has been without cardiac complaints.

Laboratory examinations showed normal electrocardiography, normal X-ray examination of thorax, and normal haemoglobin, leukocyte count, aspartate aminotransferase, creatinin kinase, creatinin kinase isoenzyme-B, serum potassium, serum sodium, serum albumin and serum creatinine.

DISCUSSION

Side-effects in connection with the use of eye drops are rare. Severe sinus bradycardia in connection with the use of oxybuprocaine eye drops in 0.4% solution has never been described before. It has been reported that oxybuprocaine is rapidly hydrolyzed in human blood; however, its metabolism has not yet been studied in detail (2).

Applebaum & Janus (3) reported only eight instances (0.208%) of adverse reactions in 12493 reported applications of various eye drops. Among these, oxybuprocaine 0.4% was used in association with fluorescein 0.25% in five cases. This mixture was used in 5153 of the reported applications. The adverse effects reported in these five cases were as follows: one case with increased intraocular pressure; one case with a stinging, "pinching feeling" in both eyes; one case

with coldness and dizziness followed by fainting with normal blood pressure and pulse rate; one case with burning, itching, redness and lid swelling; and one case with pseudoexfoliation of the lens capsule, which had normalised 24 h later.

In seven of the eight cases (3), a topical anaesthetic was the pharmaceutical agent associated with the adverse effect. The majority of adverse reactions to topical anaesthetics reported were subjective complaints which were transient and not accompanied by objective signs. The explanation for the predominance of adverse reactions with the use of topical anaesthetics may be related to the high use rate of these agents in the study referred to (59% of total applications) (3).

The reason for the two periods of bradycardia in this case could be explained either by an allergic reaction to oxybuprocaine, or by a high blood level obtained because of rapid absorption of a normal dose of oxybuprocaine from the highly vascularised tissue in the acutely inflamed conjunctivae (4).

The patient had never had cardiopulmonary com-

plaints before admission nor has he had them in a follow-up period of 10 months through his general practitioner after discharge from hospital, so a cardiac genesis of the two episodes of bradycardia is not likely.

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