

Nasal bacterial carriage in adult epistaxis: is neomycin the answer?

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Abstract

Introduction: After treatment of epistaxis, patients are routinely supplied with an intranasal bactericidal cream containing neomycin. Neomycin cream is effective in preventing recurrent paediatric epistaxis. This study aimed to assess whether there is an increased rate of nasal bacterial infections in adult epistaxis patients.

Methods: Between October 2004 and April 2005, nasal swabs were taken from adult patients presenting with epistaxis, and from a control group comprising elective ENT patients.

Results: There were 23 controls and 26 epistaxis patients. *Staphylococcus aureus* was grown in 21 per cent and 23 per cent, respectively. There was no significant difference in bacterial carriage rates between the epistaxis and control groups.

Conclusions: The epistaxis and control groups demonstrated the same bacterial species and the same proportion of bacterial carriage. Although the majority of bacterial species encountered were sensitive to neomycin, a significant proportion was not. These results do not support the routine use of neomycin in the prevention of recurrent adult epistaxis.

Key words: Epistaxis; Bacteria; Neomycin

Introduction

Epistaxis is one of the most common causes for emergency admission to UK ENT wards, and it affects approximately one in 1000 of the population per year.¹ Epistaxis in children is also a common condition, with up to 56 per cent of children aged six to 10 years experiencing it at some point.² In the vast majority of patients, particularly in adults, the aetiology remains unknown. Trauma, alcohol and anticoagulants (such as warfarin or aspirin) have been implicated.^{3–5}

The management of epistaxis can take many forms, ranging from simple pinching through to packing, cautery and, ultimately, arterial ligation.^{6,7} However, once the initial bleed is managed, patients are commonly supplied with an intranasal bactericidal cream such as arachis oil with chlorhexidine and neomycin (sold as Naseptin; Alliance, San Diego, California, USA).

Neomycin is an aminoglycoside antibiotic. It is effective against most Gram-negative bacteria (except *Pseudomonas aeruginosa*) and against some Gram-positive bacteria (including staphylococci but not streptococci). In children, it has been shown that recurrent epistaxis is associated with nasal

colonisation by *Staphylococcus aureus*, and that simple neomycin cream is effective in preventing recurrent epistaxis.^{8,9} There is, however, no evidence that it is effective in adults.

If an increased bacterial carriage rate were a contributory factor in adult epistaxis, one might expect to find an increased bacterial carriage in epistaxis patients, and perhaps a difference in intranasal bacterial flora. This study aimed to assess whether adult epistaxis patients had an increased rate of nasal bacterial infection, which may be contributing to their problem, and, if so, whether neomycin was an appropriate antibiotic to use in this situation.

Methods

Between October 2004 and April 2005, nasal swabs were taken from patients aged over 18 years who presented with epistaxis at the ENT department of the Monklands District General Hospital, Airdrie, Scotland. A control group was also recruited, comprising elective ENT patients attending the pre-operative assessment clinic. In the epistaxis group, patients were excluded if

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they had a traumatic aetiology or had been treated with either local anaesthetic spray or Naseptin (as both have bactericidal qualities). They were also excluded if they had been successfully packed with a nasal tampon, because the presence of a pack, acting as a foreign body, could alter the bacterial flora. In the control group, patients were excluded if they were attending for a rhinological procedure or had an active upper respiratory tract infection.

Sterilin[®] (Copan, Brescia, Italy) microbiology swabs were taken from the nasal mucosa on the bleeding side in the epistaxis group, and from either side in the control group. Swabs were sent for standard (aerobic and anaerobic) microbiological culture and sensitivity.

Results

Forty-nine patients were recruited into the study: 23 in the control group and 26 in the epistaxis group. The groups were of a comparable age range, as shown in Table I.

Control group patients were drawn from those attending a pre-operative assessment clinic prior to undergoing an otology or head and neck procedure, including: laryngopharyngoscopy, salivary gland surgery, thyroidectomy, middle-ear and mastoid surgery, grommet insertion, and tonsillectomy.

Staphylococcus aureus was grown in 23 per cent ($n = 6$) of the epistaxis group versus 21 per cent ($n = 5$) of the control group. Coagulase-negative staphylococcus was grown in 11 per cent ($n = 3$) of the epistaxis group and 34 per cent ($n = 8$) of the control group. Normal skin flora was grown in 11 per cent ($n = 3$) of the epistaxis group and 13 per cent ($n = 3$) of the control group. There was no microbial growth in 50 per cent of the epistaxis group and 30 per cent of the control group. There was no significant difference in the microbiological species grown on culture, comparing the epistaxis group and control group. These results are summarised in Figure 1.

Discussion

We found no discernible, significant difference in bacterial carriage between the epistaxis group and the control group. The nasal flora demonstrated in this study was in agreement with that reported by earlier studies, which showed that *S aureus* and *S epidermidis* (identified in the present study as part of the normal skin flora) form the bulk of the

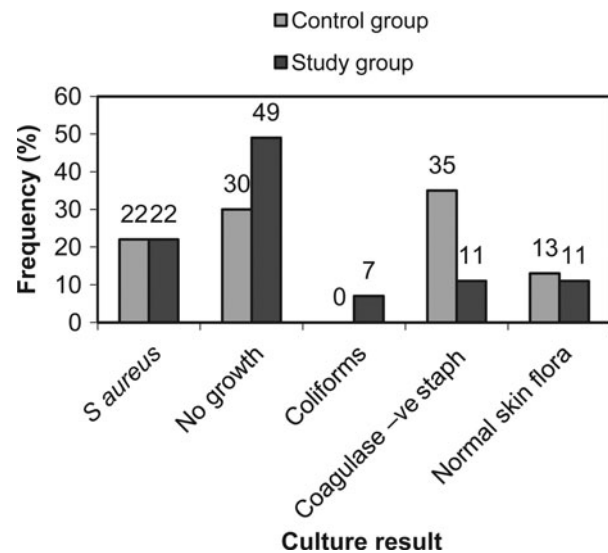


FIG. 1

Microbiological culture results and growth frequency in the control and study groups. -ve = negative

normal nasal bacterial flora.¹⁰ Other work has shown, in agreement with the present study, that *S aureus* is the most commonly found nasal bacterial species, comprising 20–40 per cent of intranasal species cultured.¹¹

Neomycin is active against most Gram-negative bacteria, and against some Gram-positive bacteria including staphylococci but not streptococci. In our patients, neomycin would have been active in most cases, but would have had no effect on streptococci species in the skin flora. All the bacteria identified (with the exception of coliforms) were expected components of the nasal flora. The coliforms identified were from the epistaxis group, and may have indicated digital trauma as both the means of nasal contamination and the aetiology of the epistaxis. No increase in the bacterial carriage rate was identified in the epistaxis group.

- **Adult epistaxis has a more varied aetiology than childhood epistaxis, with anticoagulants, antiplatelet agents and alcohol playing a more important role**
- **This study calls into question the routine use of topical neomycin in the treatment of adult epistaxis**
- **With increasing concerns over antibiotic resistance, the use of topical neomycin should be reserved for obviously infected noses, with or without epistaxis**

TABLE I
SUBJECT DEMOGRAPHICS

Parameter	Study group	Control group
n	26	23
Mean age (yr)	67	50
Age range (yr)	32–95	18–78

Yr = years

We would suggest that the use of topical neomycin in cases of adult epistaxis is unproven. It may be that the chlorhexidine in Naseptin, acting as an antiseptic, is the effective agent. Equally, it may

be the emollient effect of the arachis oil in Naseptin which is beneficial. Would simple petroleum jelly be as useful in preventing crusting in adults (fulfilling the same role as arachis oil)? The role played by petroleum jelly in epistaxis has not been proven, and in children it has been shown to have no advantage over watchful waiting.¹² The use of Naseptin in paediatric epistaxis is based on more sound evidence, with studies showing that it may have as much benefit as cautery.^{8,13,14} However, a recent Cochrane review cast doubt on the power of these studies, and suggested there is no strong evidence for the use of neomycin cream, even in children.¹⁵ Despite this, a more recent study has shown that *S aureus* infection is linked to epistaxis in children.⁹

Conclusion

Adult epistaxis has a more varied aetiology than childhood epistaxis, with anticoagulants, antiplatelet agents and alcohol playing a more important role. This study calls into question the routine use of topical neomycin in the treatment of adult epistaxis. Current evidence supporting its use is lacking. With increasing concerns over antibiotic resistance, the use of topical neomycin should be reserved for obviously infected noses, with or without epistaxis. Further research is required in order to compare the effectiveness of the various topical treatments currently used to treat adult epistaxis.

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