EVALUATION OF CONJUNCTIVAL AND NASAL BACTERIAL CULTURES BEFORE INTRA-OCULAR OPERATIONS*†

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To assess the value of pre-operative conjunctival bacterial cultures it was decided to find whether the conjunctival flora present at the time of admission to hospital had altered significantly by the time the operation was performed, and also to assess the influence of the nasal flora upon the conjunctival findings. Fungi were not included in this study.

Method

65 patients awaiting cataract extraction were admitted to hospital on the day before operation. None of them had any topical or systemic treatment before or after admission. In each case, both eyes were white and quiet and the naso-lacrimal ducts were patent. At the time of admission, conjunctival swabs were taken from the lower fornix of each eye on dry, sterile cotton-wool applicators, and immediately plated onto blood agar. The plates were incubated overnight and the results read immediately before operation on the following day. All the swabs were taken and plated by the author personally.

Also at the time of admission, swabs were taken from each nostril by the author, using dry, sterile cotton-wool applicators. These swabs were all plated within 2 hours.

The conjunctival cultures were repeated by the author, using the same technique, when the patient was on the operating table but before the instillation of any drops.

Results

Because of various hitches, for example the premature instillation of drops pre-operatively, only 109 eyes could be analysed completely.

The findings will be considered in two parts, each being related to the clinical follow-up:

- I. A comparison between the conjunctival flora on admission and immediately pre-operatively for each eye.
- II. The relationships between the nasal and conjunctival flora.

I. The normal upper respiratory tract flora in the Manchester area include *Neisseria catarrhalis*, diphtheroids, coagulase-negative staphylococci, and *Haemophilus influenzae*. These are not generally regarded as contraindicating operation, although some surgeons will not operate in their presence.

The results are shown in Table I; 38 eyes (35 per cent.) showed different results on the two days. Of the three eyes initially showing bacteria too dangerous to allow operation, two became sterile and one remained unchanged. Of the three eyes

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which developed more dangerous infections, one underwent operation without complications (*Staphylococcus pyogenes*), one was the unoperated eye of the pair (*E. coli*), and one developed panophthalmitis and lost the eye (*pneumococcus*).

TABLE I
COMPARISON OF RESULTS OF CONJUNCTIVAL CULTURES TAKEN ON ADMISSION TO HOSPITAL,
AND IMMEDIATELY BEFORE OPERATION (109 EYES)

Organisms	Swabs on Admission	Pre-operative Swabs					
		Un-changed	Altered Flora				
			Sterile	Nurft	<i>Staph. pyogenes</i>	Pneu-mococci	<i>E. coli</i>
Sterile	66	52					
*Nurft	40	18	19	14	1	1	1
<i>Staph. pyogenes</i>	2	1	1				
Pneumococci	1	0	1				

* Normal upper respiratory tract flora

Comment.—Out of the 109 eyes, only one possible catastrophe was prevented by the conjunctival swabs taken on admission. This was the case in which *Staphylococcus pyogenes* was present on admission and still present immediately pre-operatively. Operation was postponed because of the report on the first culture. That an intra-ocular infection in this case would not necessarily have followed an intra-ocular operation is shown by the case in which an eye with *Staphylococcus pyogenes* present immediately pre-operatively underwent cataract extraction without any complications.

The one catastrophe which did occur was not prevented by the conjunctival culture taken on admission.

From these results it is obvious that cultures taken before the day of operation cannot be relied on to show the flora which will be present at the time of operation, and that their value is therefore doubtful at best. This concurs with the opinion of Burns (1959), who analysed eleven cases of post-operative infection occurring in 8,038 eye operations and concluded that routine pre-operative bacteriological assessment was not of great help. A better rationale of treatment would be the instillation of antiseptics topically from admission up to operation, allied to clinical judgement of the eye. Any eyes appearing at all infected must have operation postponed until they are white and quiet. Antiseptics are to be preferred to antibiotics because of their wider range of activity against organisms, and because of the possible emergence of antibiotic-resistant strains (Artemiev and Kapkaeva, 1960; Roemer, Naumann, and Matz, 1963; and Hallermann, 1963). Hallermann recommends the use of a quaternary ammonium solution. Routine conjunctival culturing could then be abandoned.

II. The results of conjunctival culture on two successive days were compared with those of nasal culture for 97 eyes of patients admitted for cataract extraction (Table II, opposite). All the 97 nostrils investigated possessed some or all of the normal upper respiratory tract flora for the Manchester region.

TABLE II
COMPARISON OF RESULTS OF 97 NASAL CULTURES TAKEN ON ADMISSION WITH
CONJUNCTIVAL CULTURES TAKEN SIMULTANEOUSLY, AND IMMEDIATELY BEFORE OPERATION

Organisms	Nasal Swabs	Conjunctival Swabs on Admission	Pre-operative Conjunctival Swabs					
			Unchanged	Altered Flora				
				Sterile	Nurtf	<i>Staph. pyogenes</i>	Pneumococci	<i>E. coli</i>
Sterile	0	60	50		10			
*Nurtf	97	34	17	14		1	1	1
<i>Staph. pyogenes</i>	32	2	1	1				
Pneumococcus	0	1		1				
<i>Strep. viridans</i>	3	0						
Proteus.	2	0						

* Normal upper respiratory tract flora

From the clinical viewpoint, most interest must centre on the 37 nostrils which also contained flora generally regarded as contraindicating intra-ocular operation when found in the conjunctival sac. Of these, only one of the corresponding eyes showed or developed the same organism (the persisting *Staphylococcus pyogenes*). This eye was not operated on. The others had cataract extractions without antibiotic cover and without mishap.

Comment.—The nasal bacterial flora do not need to be considered when planning an intra-ocular operation, except perhaps in cases of recurrent conjunctivitis.

Summary

Conjunctival and nasal cultures were taken on admission from 65 patients coming into hospital for cataract extraction, and conjunctival cultures were again taken immediately before operation.

From comparisons of the various culture results, together with a clinical follow-up, it is concluded that pre-operative conjunctival cultures are inadequate as a safety measure, and it is recommended that they be replaced by a regime of topical anti-septic drops from admission up to the time of operation. The final decision on whether or not to operate should be based on the clinical appearance of the eye.

The nasal flora are not significant as a guide to likely conjunctival infection and can normally be ignored in intra-ocular operations.

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