Distribution and shifting trends of bacterial keratitis in north China (1989–98)

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Aims: To study the distribution and shifting trends of bacterial keratitis.

Methods: The data of 2220 corneal isolates from 1 January 1989 to 31 December 1998 were reviewed retrospectively.

Results: Positive culture was recovered in 490 isolates. Gram positive cocci and Gram negative bacilli represented 51% and 39.4%, respectively. *Pseudomonas aeruginosa* was the most common pathogen (32.2%). A gradual increase in the percentage of Gram positive cocci coupled with a decrease of Gram negative bacilli.

Conclusion: *Pseudomonas aeruginosa* and coagulase negative *Staphylococcus* were the most common pathogens in bacterial keratitis in north China.

Keratitis caused by bacteria usually results in various corneal lesions, and even severe visual loss. In developing countries, bacterial keratitis has become the most common cause of corneal blindness. Based on data over 10 years (1989–1998), we carried out a detailed aetiological analysis.

MATERIAL AND METHODS

From 1 January 1989 to 31 December 1998, bacterial cultures were carried out on 2220 cases. Culture media: blood agar plate, routine culture media, and identified culture media. Specimens were inoculated on culture media in 35°C for 24–48 hours.

RESULTS

Of the 2220 corneal isolates, mono-bacterial positive culture was found in 490 isolates (table 1). Gram positive cocci were found in 250 isolates (51.0%); most of these were coagulase negative *Staphylococcus*. Gram negative bacilli isolates accounted for 45 (9.2%). Gram negative bacilli isolates were found in 193 (39.4%), mainly *Pseudomonas* spp (see table 2).

The gradual increase in the percentage of Gram positive cocci (25% in 1991 to 70.8% in 1997, p<0.01), and decreasing trend in Gram negative bacilli (69% in 1990 to 23.4% in 1997, p<0.01), are shown in figure 1.

The percentage of *Pseudomonas* spp followed a trend of decrease (58.6% in 1990 to 24% in 1998, p<0.01), as shown in figure 2.

DISCUSSION

According to our study, Gram positive cocci is still the leading causative organism of bacteria keratitis, and the percentage of Gram positive cocci showed an increased trend. *Pseudomonas* spp accounted for 32.2% of the total corneal positive cultures, but it decreased year by year. The data from
America showed that *P. aeruginosa* accounted for 25.7% of total positive bacterial isolates. A study in India showed that Gram positive organisms accounted for 82.4%, while Gram negative organisms 16.1%. Compared with that study, our data from north China have shown a lower percentage of Gram positive bacteria and a relatively higher percentage of Gram negative for keratitis.

**Figure 1** Shifting trends of different organisms by year.

**Figure 2** Shifting trend of *Pseudomonas* spp isolates by year.

### New mutations in the PAX6 gene in patients with aniridia

Three novel mutations in the PAX6 gene have been found in patients with aniridia, adding to the data base of more than 200 different mutations in this gene. Overall, aniridia has an incidence of about 1/80 000, and mutations in the PAX6 gene on chromosome 11p13 are responsible for about 80% of cases, both sporadic and familial. Normal eye development is highly susceptible to the degree of PAX6 expression. Haploinsufficiency causes aniridia and overexpression leads to microphthalmia.

The three new recently reported mutations were found in patients who were all heterozygous for their mutation. In one instance the mutation was found in three members of the same family—brother, sister and mother.

The PAX6 gene encodes a transcriptional regulator and produces two alternative splice isoforms that have distinct DNA binding specificities. Mutations are found throughout the gene so that extensive investigation is required in each case. The new mutations reported are all from unrelated families, and all probably lead to a truncated PAX6 protein. The first family carried a nonsense mutation in exon 8, another patient had a mutation in exon 10 and the third patient had a mutation which lead to aberrant mRNA splicing.

These findings indicate further the need for comprehensive genetic counselling in patients with aniridia in whom PAX6 mutations are detected.

**References**