Occurrence of yellow and blue-green fluorescence exhibited by renal tubular cells, red blood cells, and lymphocytes found in urinary sediments of renal allograft recipients immunosuppressed with cyclosporin A

Treatment with cyclosporin for immunosuppression in renal allograft recipients was started in this hospital at the beginning of the year. Cyclosporin is nephrotoxic, but the exact mechanism by which the nephrotoxic effect is excited is unknown. In this preliminary study three cases were examined in an attempt to recognise the effect of cyclosporin on a cytological basis.

Fresh preparations of urinary sediment were stained in the usual way by Giesma, methylgreen pyronin, and Papanicolaou. One preparation was also subjected to study under blue light fluorescence.

During the first two to three days after the allograft when the patients were receiving a high dose of cyclosporin most of the cells in the urinary deposits showed faint yellow fluorescence. By the third day cells had appeared that displayed a variable degree of blue-green fluorescence extending from just the nucleus or periphery of the cell to the entire cell. The number of cells exhibiting blue-green fluorescence and the intensity of fluorescence continued to increase as the dosage of cyclosporin was maintained. The types of cells that displayed the blue-green fluorescence were initially tubular cells, renal tissue fragments, lymphocytes, and red cells, if these were present. The cells were identified by phase contrast microscopy. The blue-green fluorescence appeared only when high doses of cyclosporin were given, and on three occasions whole blood monitoring of cyclosporin by radioimmunoassay showed cyclosporin concentrations above 1000 ng/ml. When the dosage of cyclosporin was reduced fewer cells exhibited blue-green fluorescence, and the intensity of the fluorescence was reduced. The urinary deposits from recipients of renal allografts on low maintenance doses of cyclosporin were also examined and no blue-green fluorescence was observed.

The urinary sediments from patients other than recipients of renal allografts, and who were not receiving cyclosporin treatment but were receiving various other drugs were also examined, and no blue-green fluorescence was seen. Cell deposits from other body sites such as pleural effusions and breast cyst fluids, were also examined and blue-green fluorescence was not observed. In all of these samples many cells did show varying degrees of yellow fluorescence that were considered to be non-specific.

Various types of cells were bathed in vitro in solutions of cyclosporin for varying times both at 37°C and 22°C (room temperature) and then examined for evidence of fluorescence. No blue-green fluorescence was seen, which suggested that a metabolite of cyclosporin may have been responsible for the blue-green fluorescence seen in renal cells when high doses of the drug were being given.

We found that it was essential to examine fresh samples of urine as the blue-green fluorescence tended to fade and after two hours had sometimes disappeared altogether. Specimens of urinary sediment were examined on a Laborlux 12 microscope with an HBO 50 watt lamp, an excitation filter 450–490 nm, a beam splitter cut off at 510 nm, and a suppression filter above 515 nm. Cells exhibiting blue-green fluorescence were photographed using Kodak 400 daylight with an exposure time of two minutes.

The discovery of cells that exhibit blue-green fluorescence in the urinary sediments from recipients of renal allografts may be a simple indicator of cyclosporin toxicity. Further studies are in progress.

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Indifferent streptococci in sticky eyes of neonates

We read with interest the paper by Reeder *et al*¹: over the past 12 months we have attempted to speciate α haemolytic streptococci (*Streptococcus viridans*) isolated from "sticky" eyes of neonates in our maternity unit. We were prompted to do this because of the frequent isolation of this heterogeneous group of streptococci (15%) among a wide range of other organisms from eye swabs of our babies,² and particularly because we were uncertain about their clinical importance. Most of the earlier reports had either not commented on the possible pathogenicity or had not speciated these α haemolytic streptococci (apart from pneumococci), and the advent of convenient rapid identification systems such as the API 20 Strep have enabled subdivision of this diverse group of streptococci. We agree with Bone³ that although *S. viridans* is a convenient label for clinical purposes, this is merely a heterogeneous collection of strep-

tococci. Our investigation concentrated on those neonates with sticky eyes whose swabs yielded only α haemolytic streptococci and no recognised bacterial pathogen. Sixty-two babies were identified in this way and because the sticky eye in each case cleared up quickly and without specific topical antimicrobial treatment further culture for chlamydias was not undertaken.

All 62 α haemolytic streptococci were from primary isolation on 7% horse blood agar layered plates and were speciated by the API 20 Strep system (Table). Most speci-

Speciation of streptococci from neonatal eye swabs

<i>Streptococcus</i> sp	No (%)
<i>S. mitis</i> (mitior)	30 (48.4)
<i>S. sanguis</i>	14 (22.6)
<i>S. salivarius</i>	7 (11.3)
<i>S. bovis</i>	4 (6.4)
Unspecified	7 (11.3)

mens (49) did not yield large numbers of cells on smear film, suggesting a low pathogenicity, and no obvious differences in inflammatory response were found between the different species of α haemolytic streptococci. All isolates were sensitive to cloxacillin, ampicillin, amphotericin, rifampicin, vancomycin, gentamicin, and trimethoprim, all were resistant to neomycin, and there was variable sensitivity to sulphonamide.

These figures are similar to those of Reeder *et al*,¹ but the obvious difference is the absence of *S. mutans* from our isolates. Although we readily identify this species from other sources, we are unable to account for this discrepancy, but as Reeder *et al* observed, *S. mutans* cannot usually be isolated from the oral cavity of edentulous infants. Interestingly, Pierce *et al*⁴ reported isolates of *S. viridans* in infants with ophthalmia neonatorum compared with their control group, and Prentice *et al*⁵ believed that *S. viridans* were statistically related to conjunctivitis and therefore were pathogenic. In the case of our babies, however, no important pathogenic role could be ascribed to these isolates as they cleared up so rapidly without treatment. We agree with Bone³ that these streptococci do not require specific treatment, and most are probably the normally acquired upper respiratory commensals. Nevertheless, the potential pathogenicity of these isolates under certain circumstances—even minor trauma of the eye during delivery, or over enthusiastic cleaning or swabbing of the eye—for example, cannot be denied.

The source of these streptococci could be