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Is microbiological analysis of donor cornea transport culture media necessary?

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PURPOSE. *To investigate microbial contamination of the transport medium. Examination of corneoscleral rims is not included in this series.*
METHODS. *Transport media of 63 consecutive grafts done at Tennent Institute of Ophthalmology, Glasgow, were collected for microbial examination.*
RESULTS. *None of the culture plates showed any growth after prolonged culture, and microscopy was negative in 100% of cases.*
CONCLUSIONS. *Routine culture of transport media may not be necessary. (Eur J Ophthalmol 2009; 19: 137-8)*

KEY WORDS. *Microbial contamination, Grafts, Transport medium, Routine culture*

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INTRODUCTION

Precautions are taken to reduce risk of transmitting disease of donor corneas in keratoplasties. It is current practice that corneoscleral rims and donor cornea culture media are sent for cultures to detect viable microorganisms. We examined the microbiology results of culture media and evaluated their use in current clinical practice.

METHODS

We conducted a retrospective review of culture results of donor cornea culture media of 63 corneal grafts performed at Gartnavel General Hospital, Glasgow, between May 2006 and November 2007. A total of 33% (21) of the procedures were deep lamellar keratoplasties; the remaining 67% (42) were penetrating keratoplasties. They were all elective procedures. Irrespective of the patient demographics and reason for the surgery, all donor cornea culture media were sent for Gram stain and culture. The samples submitted are first Gram stained and examined under the microscope. The transport media were analyzed both qualitatively and quantitatively. The quantitative analysis is detailed as follows. Aliquots of 0.1 mL of the medium were dropped onto the surface of two blood agar plates, one chocolate agar plate, and two Sabouraud-dextrose agar plates. The 0.1 mL aliquots were spread over the entire surface of the agar plates. One blood agar plate was incubated aerobically and the other anaerobically, both at 37 °C for 48 hours, and then at 30 °C for a further 5 days. The chocolate plates were incubated at 37 °C in CO_2 for 7 days. The Sabouraud-dextrose plates were incubated for 14 days at two different temperatures: one plate at 37 °C, and the other at 30 °C. Colonies on the plates were counted at the end of the incubation period and values were given as colony forming units per liter. Any isolates were identified as above and then stored.

RESULTS

Microscopy

All the microscopy results obtained from the 63 donor cornea culture media were negative. No microorganisms were detected.

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Cultures

All the culture results (63/63; 100%) showed no growth after extended incubation.

DISCUSSION

The development of bacterial keratitis after keratoplasty is a serious complication associated with a high incidence of graft failure and poor visual outcome. There is 4.9% incidence of culture-positive bacterial keratitis following penetrating keratoplasty (1). Fungal keratitis is also an infective complication, especially with the use of topical steroids postoperatively (2). Herpes simplex keratitis accounts for 8% of all microbial keratitis post-corneal graft surgery (3). Endophthalmitis is a rare complication, occurring in 0.2–0.7% of cases (1).

Before donor cornea is accepted for use in keratoplasty, the donor is tested for infections. This is done to minimize the risk of graft-borne postoperative infection. Additionally, it is current practice to send the donor corneoscleral button and donor culture transport medium for screening of infection. Detection of HSV in donor culture medium could not be used as an indication for discarding the donor cornea, and testing for HSV was discontinued (4).

The donor graft transport medium consists of 5% dextran, 2% fetal bovine serum, and antibiotics, penicillin (100 U/mL), streptomycin (0.1 mg/mL), and amphotericin B (0.25 µg/mL). In our study, 63 transport media microscopy and culture reports over the period of 18 months were examined. No microorganisms were detected on microscopy, and all culture media showed no growth after prolonged incubation.

Other series have showed that there is poor correlation between culture-positivity of donor media and corneoscleral rims and development of microbial keratitis and/or endophthalmitis (5, 6). Our series further shows that examination of donor culture transport media is not useful in clinical practice and might not be essential and cost-effective to be performed on a regular basis.

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