

# Staph in your Eyes

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## INTRODUCTION

A young man presenting with endophthalmitis after eye surgery and cultures positive for *Staphylococcus equorum*, led to questions about frequency of its occurrence and an outbreak investigation.

## BACKGROUND

In TTSH, eye samples taken in the Eye clinic are directly inoculated onto agar plates outside the lab. Since 2024, the microbiology lab has noticed an increased frequency of *Staphylococcus equorum* growing from eye cultures.

## METHODS

A 34 year old patient presented with left exogenous endophthalmitis 10 days after a recent left vitrectomy, membrane peel, and silicone oil surgery for retinal detachment. He underwent left eye anterior chamber washout, explantation of intraocular lens, vitrectomy, removal of silicone oil surgery and intraocular samples were positive for *Staphylococcus equorum* (on enrichment). The current presentation of exogenous endophthalmitis with an unusual organism and enquiry revealing an increased number of positive cultures of the same organism from Eye clinic prompted an investigation into a possible outbreak of *S. equorum* eye infections.

## Case definition

A case with any type of ocular infection with samples positive for *S. equorum*. The Study Period was from 1 Jan 2022-30 Nov 2025.

## Case search

The laboratory did a search within MALDI-TOF results from sample cultures from 1 Jan 2022-30 Nov 2025. *S. equorum* had been identified from 14 eye samples, with the first case only starting on 23 Oct 2024. No non-eye sample types were found, although the same media were used for other sample types. There were no recent MALDI-TOF database changes for the identification of *S. equorum*. All samples were released to the clinical teams as “Coagulase negative staphylococcus” and antibiotic susceptibility was not reported.

Speciation was reported for this case as per request from ID as they

## ACTIONS

### Line listing

Line listing was done for all reported cases. A walk through and inspection was done of the relevant areas in the eye clinic and emergency department where eye swabs are taken. Staff and doctors were interviewed and observed during sample collection. Equipment and storage conditions of culture media were examined.

## FINDINGS

The samples had been obtained by different staff, and been done in different rooms. Some of the agar plates were stored sideways in the eye clinic and test tubes containing brain heart infusion broth in the emergency department were stored horizontally, both of which increased the risk of contamination. No other additives were added to the samples and all sample collection equipment was sterile. One clinician was observed using non-sterile gloves during sample collection, and was interrupted to perform other tasks during the procedure. Interviews confirmed this to be widespread practice. The agar plate was unsupported during inoculation, with a risk of contamination from contact between the swab sticks and the sides of the agar plates.

Randomly selected unused blood and chocolate agar plates from the eye clinics and the emergency department were sent for cultures and all returned negative.

## DISCUSSION

From the walkthrough, some lapses in maintaining sterility were identified. However, this did not explain why *S. equorum* in particular was isolated.

*S. equorum* was not treated as clinically significant in most cases, with more common causative pathogens identified. There was no clustering by month of occurrence. Most samples were collected in clinic 1A, reflective of the case load of the Eye department. (Fig. 3) The patients were evenly spread across age and gender, with the spread of race being reflective of Singapore’s demographic trends. (Fig. 2) We were unable to identify any common characteristics or trends to explain the

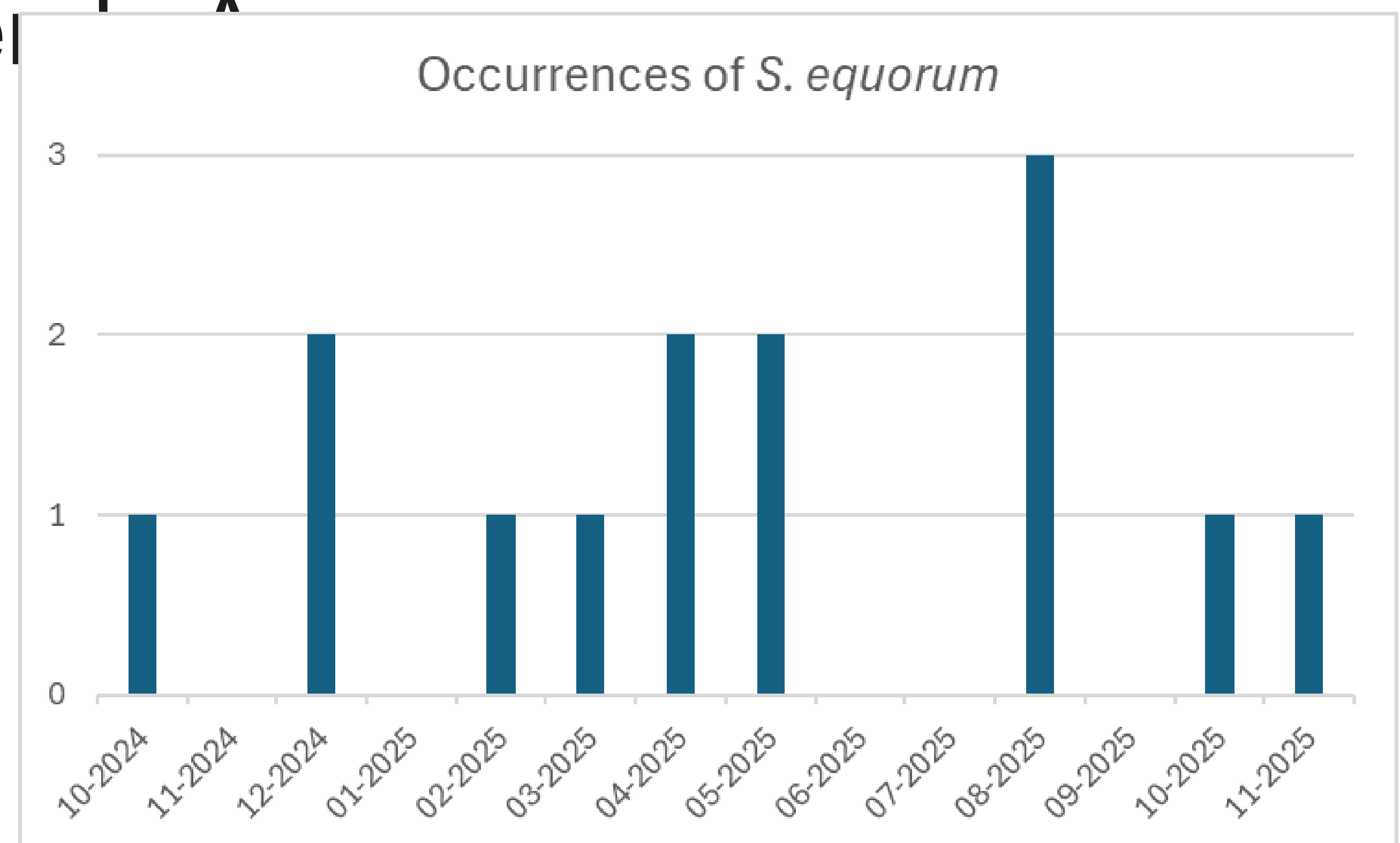


Fig 1. Monthly trend of occurrences

| Age   |   | Sex    |   | Race    |    |
|-------|---|--------|---|---------|----|
| 40-49 | 2 | FEMALE | 7 | CHINESE | 10 |
| 50-59 | 0 | MALE   | 7 | INDIAN  | 2  |
| 60-69 | 3 |        |   | MALAY   | 1  |
| 70-79 | 3 |        |   | OTHERS  | 1  |
| 80-89 | 2 |        |   |         |    |
| 90-99 | 3 |        |   |         |    |

Fig 2. Characteristics of patients

| Location          |    | Sample Type             |    |
|-------------------|----|-------------------------|----|
| Clinic 1A         | 10 | Anterior chamber fibrin | 1  |
| Operating theatre | 2  | Aqueous fluid           | 1  |
| Ward              | 2  | Corneal scrape          | 6  |
|                   |    | Necrotic fat graft      | 1  |
|                   |    | Vitreous fluid          | 5  |
| Grand Total       | 14 | Grand Total             | 14 |

Fig 3. Characteristics of samples

*S. equorum* has previously been isolated in fermented foods and cheese, as well as from animals such as cattle and sheep. It is not classically known to be part of the human microbiome. [1] Coagulase negative staphylococci (CoNS) have been reported to exist as part of the corneal microbiome [2] however there is little literature on *S. equorum* specifically. A small study on the effect of stress on the ocular microbiome [3] found that *S. equorum* was one of the most common bacteria isolated. A study in 1999 which speciated CoNS isolated from eye infections cited 1 sample from a patient with chronic blepharitis with *S. equorum*. [4]

Other more recent studies into the ocular microbiome cite *Staphylococcal* species but without the full species name. [5] Differences in the ocular microbiome have been found in different weather conditions [3], different countries, and in disease states [5]. Although uncommon, *S. equorum* has been reported to be found on the corneal microbiome. [3][4] The positive samples in this case could reflect inadvertent inoculation of these organisms. Future research may look into the specific species of CoNS in the ocular microbiome and whether the increased counts of *S. equorum* may be linked to disease.

## CONCLUSION

We have investigated a series of cases with eye cultures positive for *S. equorum* in TTSH from Oct 2024 to Nov 2025 for a possible outbreak and concluded it was not a true outbreak but a pseudo-outbreak. Lapses were found in storage conditions of media and sample collection procedures by clinicians, but no point source of infection or contamination was identified.

Discussions were held between Infection Prevention and Control and the head of Eye department and clinic staff on improving compliance to aseptic technique and storage conditions of media and plates.

Subsequently, there has been a return to baseline rates of CoNS from

## REFERENCES

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