

LETTER TO THE EDITOR

The microbiology of indwelling pleural catheter infections

Dear Editor,

We are impressed by the robust proportion meta-analysis recently conducted by Wang et al.¹ The increasing use of indwelling pleural catheters (IPCs) in pleural disease is predicated upon a sound understanding of any ensuing complications. Their overall finding of total infections occurring in 5.7% (95% CI 4.0–7.7) of IPCs is consistent with rates reported elsewhere² and we commend the authors for further studying types of infection and estimating that pleural infections develop in 1.3% of patients (95% CI 0.6–2.2).

While pleural infections are clearly an important complication, there are limited data regarding their microbiology. In 2013, Fysh et al.³ described the experiences of 11 centers. Of 50 IPC-related infections, 41 yielded a positive culture and *Staphylococcus aureus* accounted for 48% of these infections. No other species accounted for more than 4% of infections.

Of 41 studies included in this review by Wang et al., 11 describe the microbiology of IPC-related pleural infection. Across the studies, 79 pleural infections were reported, but for three infections the organisms responsible were not named and 10 infections were culture-negative. Of the remaining 66 infections, there were 75 positive cultures because seven were polymicrobial, yielding multiple positive cultures. There were 49 and 26 Gram-positive and Gram-negative organisms, respectively. *Staphylococcus aureus* was grown in 30.3% of infections and coagulase-negative *Staphylococci* (CoNS) in 15.8%. The full results are shown in Table 1.

When contrasting the above results with those of Fysh et al., CoNS emerge as a significant cause of infection. CoNS are a common skin commensal and can colonize foreign bodies, such as IPCs, but do not always cause infection.⁴ As patients with malignant effusions often have raised inflammatory markers and symptoms consistent with infection, CoNS-positive cultures from a colonized IPC may be misinterpreted as evidence of pleural infection. These IPCs may be better described as colonized. Nonetheless, a proportion of infections are likely caused by CoNS and the relationship between colonization and infection is not well understood.

We have studied removed IPCs at our hospital and our data show from 19 uninfected IPCs, CoNS were grown from intrathoracic catheter segments in five patients, without an infection. This suggests IPC colonization is not uncommon and that CoNS-positive IPC fluid cultures should be interpreted carefully. There is need for further research to understand the relationship between IPC infection and colonization.

TABLE 1 The microbiology of 76 IPC infections of which 10 were culture-negative.

Organism	Frequency seen (n)	Percentage of infections (%) (n = 76)
<i>Staphylococcus aureus</i>	23	30.3
Coagulase-negative <i>Staphylococci</i>	12	15.8
Culture-negative	10	13.2
<i>Klebsiella</i> spp.	6	7.9
<i>Escherichia coli</i>	5	6.6
<i>Streptococcus viridans</i>	4	5.3
<i>Serratia marcescens</i>	3	3.9
<i>Pseudomonas aeruginosa</i>	3	3.9
<i>Corynebacterium</i> spp.	3	3.9
<i>Enterococcus</i> spp.	3	3.9
<i>Proteus mirabilis</i>	2	2.6
<i>Bacteroides</i> spp.	2	2.6
<i>Acinetobacter baumannii</i>	2	2.6
<i>Stenotrophomonas maltophilia</i>	2	2.6
<i>Haemophilus influenzae</i>	1	1.3
<i>Listeria monocytogenes</i>	1	1.3
<i>Streptococcus pyogenes</i>	1	1.3
<i>Streptococcus agalactiae</i>	1	1.3
<i>Staphylococcus lugdunensis</i>	1	1.3

Note: Sixty-six infections had positive pleural fluid cultures and there were seven polymicrobial infections. Table 1 has been synthesized from data provided in Wang et al.¹

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