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Short report

Empathy dolls: are they a source of cross-contamination between patients?

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SUMMARY

Following a cluster of two patients with identical strains of *Clostridium perfringens* prosthetic joint infections on an ortho-geriatric ward in a teaching hospital in England, investigations were conducted into infection control practices. It emerged that empathy dolls were being used to help alleviate agitation in dementia patients; this had been introduced without consultation with the infection prevention and control team. Environmental testing of the doll pre and post laundry at different temperatures helped to establish the types and numbers of organisms present. This testing enabled our unit to provide guidance on the optimum strategy for decontamination and safe use of these dolls.

Introduction

In our orthopaedic unit in a large teaching hospital in England, there has been a cluster of prosthetic joint infections with *Clostridium perfringens* in 2013. Based on the clinical presentation and timing of these cases, cross-infection with *C. perfringens* was suspected. Results from the Gastrointestinal Bacteria Reference Unit of the two isolates from infected hip hemi-arthroplasty tissue were confirmed as *C. perfringens* Type A by the detection of the alpha toxin gene and by the absence of beta, epsilon and iota toxin genes. In addition, both isolates were indistinguishable by molecular typing using fluorescent amplified fragment length polymorphism (fAFLP) indicating that they were from a common source. Hence, a detailed investigation into the infection control practices on the relevant ward was conducted. Several concerns were raised, including the presence of dirty commodes. However, it also emerged that the ward had purchased a number of empathy dolls for patient use, without prior consultation with the infection prevention and control team.

Doll therapy has been advocated as a useful non-pharmacological approach through promoting attachment behaviour and thereby reducing agitation in dementia patients.[1] Although its use has not been acknowledged in the UK dementia care policy or clinical guidelines, there are anecdotal reports and some empirical evidence supporting the therapeutic role of these dolls in alleviating distress and promoting comfort in patients with dementia.[2–4] Current literature and guidance on doll therapy is mainly focused on dementia

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residents in care home settings, as opposed to the hospital inpatient setting.[5,6]

In light of these dolls being used on several wards in the hospital, environmental testing was conducted to establish whether they pose a potential infection control risk with an aim to devise a suitable decontamination policy for safe use between patients.

Methods

We procured a 'used' doll from the ward following patient discharge to conduct microbiology testing pre and post laundry of the doll (Figure 1). The doll was about 40 cm × 20 cm in size and similar in appearance to a cabbage patch doll. It was made of soft outer fabric with a combination of cotton and polyester filling. It consisted of a weighted bottom to keep the doll in a sitting position. The face included embroidered eyes and a smiling expression. Environmental testing of the doll was conducted using two methods to optimize results. First, surface charcoal swabs of different parts of the doll and dress were taken and enriched in fastidious anaerobic broth (FAB). Second, pieces of the doll fabric were cut, including its hair, leg, arm and dress and the components were blended in a stomacher prior to enriching with FAB broth. Direct cultures from the broth as well as subcultures 48 h post incubation of the broth were subsequently performed. Media used consisted of tryptone soya agar (TSA), meticillin-resistant *Staphylococcus aureus* (MRSA) selective agar and neomycin blood agar. Viral surface swabs were also taken for norovirus polymerase chain reaction (PCR) testing pre laundry. We repeated the process following the 'standard' 60 °C laundry cycle.

Figure 1. Empathy doll following patient use.

The doll manufacturer cleaning instructions recommended washing the doll at 40 °C, ideally using a handwash setting. Discussions with our laundry services revealed that the doll had been washed in a standard washing machine at 60 °C and then tumble-dried until partially dry before being put on a shelf to air-dry. Dolls that were very visibly soiled were put through an 80 °C cycle and were apparently able to withstand this temperature.

Surface swabs

Charcoal swabs were moistened in saline and seven representative areas of the doll, each measuring approximately 5 × 5 cm, were swabbed. Each swab was put into a bijou containing 5 mL FAB and the suspension was vortexed. We pipetted out 1 mL of each suspension on to the three agar plates. TSA and MRSA selective plates were incubated aerobically at 37 °C and read at 24 and 48 h. Neomycin blood agar was incubated anaerobically at 37 °C and read at 48 h.

The rest of the bijou was filled with more FAB to ensure an anaerobic medium and subsequently incubated anaerobically for 48 h. Post incubation, the broth was subcultured on to neomycin blood agar and incubated at 37 °C anaerobically for 48 h.

Viral swabs were similarly taken from seven different areas of the doll. Norovirus PCR testing was conducted on these samples. As there were no documented cases of norovirus on the ward at the time of testing, these swabs were expected to be negative.

Stomacher

Representative areas of the doll fabric, including its hair, arm, leg and dress, were cut into 5 cm × 5 cm areas and blended with 18 mL maximum recovery diluent and processed in a stomacher for 6 min. One millilitre of each suspension was pipetted out into each of the following media: TSA, MRSA selective agar (both incubated aerobically for 48 h) and neomycin blood agar (incubated anaerobically for 48 h).

Enrichment cultures were also performed. Three millilitres of each suspension were enriched into FAB broth and incubated anaerobically at 37 °C for 48 h prior to subculturing on to neomycin blood agar and incubating in similar conditions.

Post-laundry testing

The sampling and testing procedure was repeated following a 60 °C wash. As there was persistence of clinically significant organisms (*Enterococcus* spp.) post 60 °C wash, further testing was done following an 80 °C wash cycle. The doll was inoculated with a pre-established number of *Enterococcus faecalis* (10^{-6} dilution of *E. faecalis* enriched in brain—heart infusion broth) and we subsequently tested the doll for presence or absence of this organism before and after the 80 °C wash cycle.

Results

The pre-laundry samples isolated a combination of skin and bowel flora from the TSA plates: coagulase-negative staphylococci, *Micrococcus luteus*, *Bacillus licheniformis*, *Bacillus firmus*, *Kocuria rhizophila*, *Enterococcus faecalis*, *Enterococcus faecium* and *Enterobacter cloacae*. The anaerobic plates isolated *Clostridium perfringens*, *Streptococcus viridans* and *Enterococcus faecalis*. Norovirus PCR and MRSA