Swabbing of waiting room magazines reveals only low levels of bacterial contamination

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ABSTRACT

Previous studies have shown that toys in waiting rooms of general practice surgeries can be contaminated with potentially pathogenic bacteria. The question was raised as to whether magazines might also be sources of contamination. Swabbing of the front page of 15 magazines from 11 general practice surgeries, followed by analysis for total and specific bacteria, revealed low levels of contamination. Among targeted groups of pathogens only two colonies of *Staphylococcus aureus* were detected. Magazines do not seem to be potentially important vectors of bacterial transfer in the setting examined.

Keywords

bacteria; culture; equipment contamination; health facilities; magazines; *Staphylococcus aureus*.

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INTRODUCTION

Toys provided for children in the waiting rooms of general practice surgeries, paediatric wards, and an intensive care unit have been previously investigated for microbial contamination.[1-5] These studies concluded that toys can be contaminated with potentially pathogenic bacteria including coliforms, *Clostridium perfringens,* and *Staphylococcus aureus*.[1-4] Soft toys were generally more contaminated than hard ones;[3,4] however, in one study the opposite was the case.[5] In response to these findings, the question was raised as to whether books and magazines in waiting rooms were also similarly contaminated.[4] The present study seeks to provide an answer to this question.

METHOD

The front page of 15 A4-format glossy, popular magazines collected from the waiting rooms of 11 general practice surgeries were investigated for bacterial contamination. Magazines were collected towards the end of the surgery day and from the top of horizontal piles, in an effort to select those most likely to be contaminated with viable bacteria. The age of the magazines ranged from 2 to 9 months at the time of collection.

The front page was swabbed to collect microbial contaminants as follows: a TECRA® ENVIROSWAB (Tecra International Pty Ltd, French Forest, New South Wales) was used to wipe the whole surface of the page. Thereafter, the swab was returned to its tube and 5 ml of tryptone soya broth (TSB, Oxoid, Basingstoke) was added. After locking the cap firmly in place, the tube was shaken vigorously for 30 seconds to release microbes to the broth. After a recovery period of 30–45 minutes at 37°C, samples (200 µl) were spread on agar media designed for the detection of total and specific bacteria. Plates were allowed to stand at room temperature for 1 hour (an additional recovery period) before being incubated at 37°C. Analyses were performed within 6–12 hours of collection of the magazines. Colonies were examined after 24 hours and again after 48 hours.

All selective growth media were obtained from Oxoid and used as directed. The results were interpreted as follows: the total microbial count (present in a 200 µl sample) was based on growth on blood agar. Colonies showing α/β-haemolyse were, after prior screening including confirmation of the absence of catalase activity, investigated to see if these were streptococci. This involved identification using the API® 20 Strep system (bioMérieux, Marcy l'Etoile, France) and an additional analysis for Lancefield antigens A, B, C, D, F, G (Streptococcal Grouping Kit, Oxoid). Black colonies surrounded by a white halo and/or a zone of clearing on Baird Parker agar were classified as presumptive *Staph. aureus*. The identification was confirmed with the demonstration of clotting of rabbit plasma (coagulase test). *Staph. aureus* isolates were investigated to see if these were methicillin resistant, using oxacillin tablets as previously described.[6] All red colonies on MacConkey's agar were Gram-stained (possible enteric bacteria). Small red colonies are formed by enterococci on the same medium; these were investigated further using the approach outlined for presumptive streptococci. The other selective media used: tryptone soya agar plates (TSAP), tryptose sulphite cycloserine (TSC), Brilliant Green (BG), and xylose lysine desoxycholate (XLD), produced no colonies.

Table 1. Bacterial contamination of 15 waiting room magazines.

Magazine	Number of colonies on specified agar medium[a]		
	SB (αβ-haemolytic)	BP (*Staph. aureus*)	MC (red colouration)[b]
1	62(0)	3(0)	94(0)
2	14(5α)[c]	7(0)	3(0)
3	5(0)	0(0)	8(4)
4	20(0)	12(0)	10(4)
5	8(1α)[d]	0(0)	4(1)
6	13(1α)[e]	1(0)	5(0)
7	8(0)	1(0)	6(3)
8	19(10α)[f]	0(0)	5(0)
9	8(0)	1(0)	15(0)
10	4(0)	0(0)	2(0)
11	115(1β)[g]	5(1)	91(28)
12	14(0)	3(0)	4(0)
13	22(0)	1(0)	10(2)
14	6(0)	0(0)	14(1)
15	7(0)	15(0)	3(0)

[a]SB = sheep's blood (for the total aerobic viable count and haemolytic species); BP = Baird Parker (for the detection of Staphylococcus aureus*); MC = MacConkey (red colonies may indicate enteric bacteria and/or enterococci). The following agar types gave no colonies: tryptone soya agar amended with 16 µg/ml penicillin G. The concentration of penicillin used, although a somewhat arbitrary choice, is the National Committee for Clinical Laboratory Standards (Wayne, PA) breakpoint for enterococci; tryptose sulphite cycloserine (for the detection of* C. perfringens*); Brilliant Green (primarily for the detection of* Salmonella *spp.); xylose lysine desoxycholate (for the detection of* Salmonella *spp. and other enteric bacteria). [b]All of the red colonies on MC plates were catalase- and Gram-positive cocci and were not investigated further. [c]5 colonies of α-haemolytic* Streptococcus mitis. *[d]1 colony of α-haemolytic* Strep. sanguis. *[e]1 colony of α-haemolytic* Strep. mitis. *[f]10 colonies of α-haemolytic* Strep. sanguis *and a Lancefield gr. D* Leuconostoc *sp. [g]Single colonies of methicillin-sensitive β-haemolytic* Staph. aureus *on blood and BP agars.*

RESULTS

The results of the investigation are summarised in Table 1. All magazine surfaces were contaminated with bacteria. Colonies of α-haemolytic streptococci (*Streptococcus mitis*; *Strep. sanguis*) were found on some covers. However, of the targeted groups of potentially pathogenic bacteria (enteric bacteria, *Staph. aureus*, *C. perfringens*, enterococci, and β-haemolytic streptococci), only two colonies of *Staph. aureus* were detected. These isolates were methicillin sensitive. No colonies grew on TSAP, TSC, BG, or XLD.

DISCUSSION

As no enteric bacteria grew on MacConkey's agar, and no colonies whatsoever appeared on TSAP, TSC, BG, or XLD, it seems likely that viable Gram-negative bacteria were not present on the magazine covers. This could be because these bacteria may not have survived the period (6–12 hours) between collection of the magazines and testing. If so, the study demonstrates that Gram-negative bacteria present on magazine surfaces become non-viable in the course of a few hours. Of the medically important Gram-positive cocci only two colonies of *Staph. aureus* (both methicillin sensitive) were found. Low numbers of α-haemolytic streptococci were found on four magazines. The species in question, *Strep. mitis* and *Strep. sanguis*, are normal inhabitants of the oral and upper respiratory tracts and are considered non-pathogenic.

Previous investigations have shown that hard toys (arguably a similar surface to magazines) in general

How this fits in

Previous studies have shown that soft toys in the waiting rooms of general practice surgeries are often contaminated with potential bacterial pathogens. For this reason, the question was raised as to whether toys should be removed, and if magazines were similarly contaminated. The present study analysed bacteria on magazines in surgery waiting rooms. Results show low levels of contamination and suggest that there is, in the case of magazines, no cause for alarm.

practice surgeries and hospital wards can be contaminated with pathogenic bacteria,[3,4] but they are not invariably so.[3,6] Although only a relatively small number of magazines were tested in the present study, these represented 11 general practice surgeries spread over two Norwegian cities. Given that only two colonies of potentially pathogenic bacteria were detected, it is probably reasonable to assume that magazines are not a significant source of cross-contamination between patients, particularly with regard to Gram-negative species.

The results of the study give no grounds for requiring the removal of magazines from waiting rooms. However, a word of caution needs to be sounded: the present study on magazines, and previous investigations of waiting room toys,[1-5] target only bacterial species. In particular, viral pathogens would not be detected by the procedures used; this aspect of waiting room hygiene could be addressed in future studies.

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