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RESEARCH ARTICLE

Role of Hand Hygiene in the Microbial Agents Contamination and Borne Infection by Finger-print Detect Device Screens, Taif, KSA

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Abstract

This paper were conducted to study role of hand hygiene in the microbial agents contamination and borne infection by Finger-Print Detect Device Screens (FDDSs), Taif, KSA. The prevalence of microorganisms (MOs) isolated from total specimens, were (50, 40 and 20%) for (G. Negative, G. Positive and Yeast) respectively. The prevalence of the mean differentiated MOs from positive specimens G. Positive were included (*Staph. Spp.* and *Strept Spp.*) as (75 and 25%). G. Negative were included (*E. coli*, *PA*, *Pro. Spp.* and *Ent. Spp.*) as (46.7, 20, 20 and 13.3%). Yeast were included as (*Can. Spp.* and *Mo. Spp.*) as (66.7 and 33.3%) respectively. Hands are consider as an important sources of MOs to the community, so this paper is advising for hand hygiene perfectly for every persons. As well as that was reflected from our simple paper research which was worked on FDDSs that often use in all companies now a day.

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INTRODUCTION

Hand hygiene is defined as washing hands and nails with soap and water or using a waterless hand sanitizer to prevent spread of infectious diseases in home and everyday life settings[1]. Waterless hand sanitize can also be used in addition to hand washing, to minimize risks. Hand sanitizers are not option in most developing countries , In situations with limited water supply, they are water-conserving solutions, such as tippy-taps (simple technology using a jug suspended by a rope, and a foot-operated lever to pour a small amount of water over the hands and a bar of soap)[2]. In low-income communities, mud, sand or ash sometimes used as an alternative to soap as it is effective as soap for removing bacteria. WHO recommended hand washing with ash if soap is not available in emergencies[3]. Medical hand hygiene tend to minimizes disease and spreading of disease. This is important for people who practice for the general public. People can become infected with respiratory illnesses such common cold, if they don't wash their hands before touching their eyes, nose, or mouth. CDC had stated "It is well documented that one of the most important measures for preventing the spread of pathogens is effective hand washing" .It protects against transmission of disease through faecal-oral routes (many forms of stomach flu) and direct physical contact[4]. Transmission of gastro-intestinal pathogens is thought to occur via hands[5]. Hand washing decrease the risk of hand contamination and the risk of food contamination by direct contact[6]. Recontamination of hands after washing with soap was fast, with base line levels reached after 1hr. Child care was associated with higher *Ent. Spp.* Counts, whereas agricultural activities increased *E. coli*. counts. Food preparation was associated with higher counts for both MOs[7]. Although most studies reported medical devices such as thermometers and stethoscopes as the implicated objects, nonmedical objects such as keyboard covers and ball pens had also been identified as reservoirs of pathogenic MOs[8]. In terms of healthcare infection transmission, transfer

of MOs through inanimate surfaces applied to indirect contact transmission, and the objects involved were termed fomites plural of the Latin fomes, object[9]. Factors that had favor transfer of MOS were large skin surface contact between flat fingers ($2 \times 20 \text{cm}^2$) and fingerprint-capturing device, nonporous contact surface, large overlap of contact surface and short turn around time between successive applicants, high contact pressure, and difficulties to disinfect devices. Enteropathogenic bacteria with low infectious doses (*Shigella Spp.*, EHEC, etc.). The fingerprinting procedure as currently used was associated with a risk of infection transmission. Simple hygienic measures caught considerably reduce this transmission risk[10]. Hand hygiene remained a general measure that significantly contributes to the prevention and control of communicable diseases; in healthcare settings, improved hand hygiene practices reduced cross-transmission of multidrug-resistant MOs, prevented healthcare-associated infections, and saved costs. Surprisingly, during last years, very little had been done to investigate the biological basis underlying the process of bacterial transmission by hands, and particularly from the side of possible variations among individual hosts[11]. A fingertip-to-fingertip intra individual transmission experiment was carried out in 30 healthy volunteers, using four MLST-typed *Ent. faecium* clones. Overall results showed an adequate fit goodness to a theoretical exponential model, whereas 13% were exhibited a significantly higher finger to finger bacterial transmission efficiency. This observation might had deep consequences in nosocomial epidemiology[12].

The aim: This research was studied the risk of hand hygiene and transfer of MOs through the FDDSs as confirmation for explored the efficiency in hand wash and transmission of MOs through FDDSs.

Materials and Methods

Practical methods: The specimens of FDDSs were collected by sterile swabs with transmitted media. The total FDDSs specimens were for pioneers (No.=30) and the control specimens were (No.=5). Total specimens were transferred to Micro. Lab. under aseptic conditions during (30-60) minutes. All specimens were going under Micro. Lab. Protocols including (culturing, isolation and identification by Standard methods)[13-14].

Data Analysis: The data were recorded and entered into Microsoft Excel Sheet, then summarized and analyzed[15].

Results and discussion

Table and figure 1: Prevalence of *MOs isolated from the total specimens

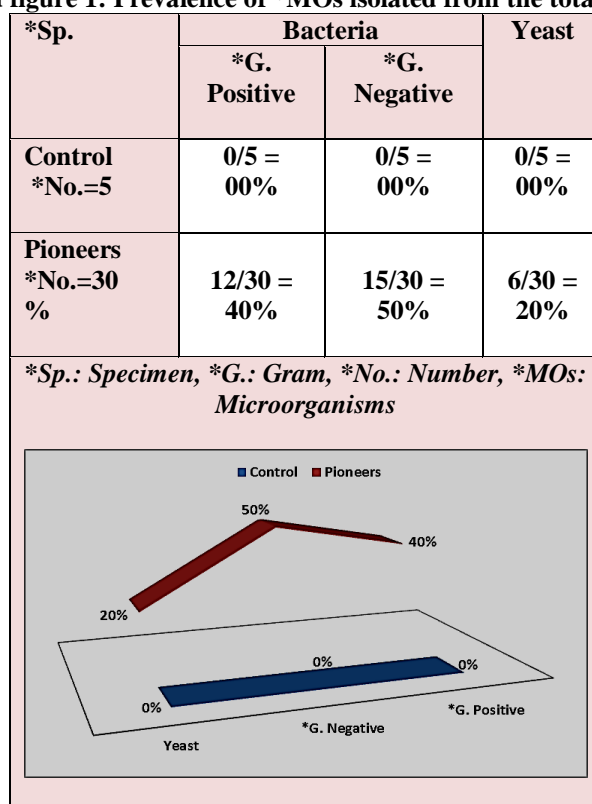


Table and figure 1 showed prevalence of MOs isolated from the total specimens, were (50, 40 and 20%) for (G. Negative, G. Positive and Yeast) respectively. G. Negative were predominant then G. Positive and lastly Yeast in the isolation of MOs. G. Negative were 1.25 times than G. Positive and 2.5 times than Yeast.

Table and figure 2: Prevalence of the mean differentiated *MOs from the positive specimens

*Sp.	Bacteria						Yeast	
	*G. Positive *No.=12		*G. Negative *No.=15				*No.=6	
*MOs *Spp.	*Staph. *Spp.	*Strept. Spp.	*E. coli	*PA	*Pro. *Spp.	*Ent. *Spp.	*Can. *Spp.	*Mo. *Spp.
*No. %	9/12= 75%	3/12= 25%	7/15= 46.7%	3/15= 20%	3/15= 20%	2/15= 13.3%	4/6= 66.7%	2/6= 33.3%

*Sp.: Specimen, *G.: Gram, *No.: Number, *MOs: Microorganisms, *Spp.: Species, *Staph.: Staphylococcus, *Strept.: Streptococcus, *E. coli: Escherichia coli, *PA.: Pseudomonas aeruginosa, *Pro.: Proteus, *Ent.: Enterococcus, *Can.: Candida, *Mo.: Moulds

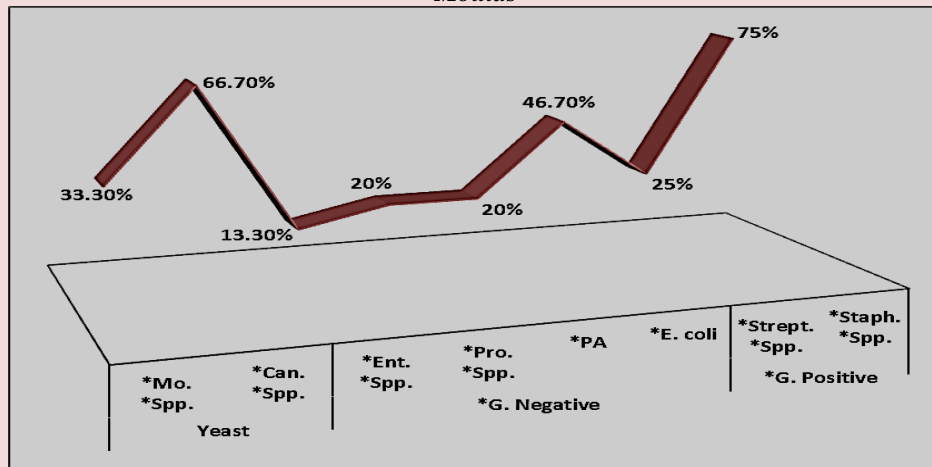


Table and figure 2 showed prevalence of the mean differentiated MOs from the positive specimens G. Positive were included (*Staph. Spp.* and *Strept. Spp.*) as (75 and 25%), *Staph. Spp.* were as 3times of *Strept. Spp.* G. Negative were included (*E. coli*, *PA*, *Pro. Spp.* and *Ent. Spp.*) as (46.7, 20, 20 and 13.3%), *E. coli* was as more than 2times of *PA*, and *Pro. Spp.*, also more than 3times than *Ent. Spp.* Yeast were included (*Can. Spp.* and *Mo. Spp.*) as (66.7 and 33.3%) respectively, *Can. Spp.* were about 2times than *Mo. Spp.* People can become infected with respiratory illnesses such common cold, for example, if they don't wash their hands before touching their eyes, nose, or mouth. Indeed, CDC had stated: "It is well documented that one of the most important measures for preventing the spread of pathogens is effective hand washing". As a general rule, hand washing protects people poorly or not at all from droplet and airborne diseases. It protects best against diseases transmitted through faecal-oral routes and direct physical contact[4]. A considerable proportion of the transmission of gastro-intestinal pathogens was thought to occur via hands[5]. Environmental interventions as improved sanitation, water access or hand washing are thought to decrease the risk of hand contamination and consequently the risk of food contamination and direct contact transmission[6]. Child care was associated with higher *Ent. Spp.* counts, whereas agricultural activities increased *E. coli* counts. Food preparation was associated with higher counts for both MOs. It may reflect immediately preceding risk practices but not household-level risk factors[7]. Medical devices as thermometers and stethoscopes as the implicated objects, nonmedical objects such as keyboard covers and ball pens had also been identified as reservoirs of MOs[8]. Transfer of MOs from environmental objects to humans had been described in both the healthcare and the community settings, and hands were known to be the main route of transfer. By consequence, fingerprinting for visa application may be prone to transfer of MOs. In terms of healthcare infection transmission, transfer of MOs through inanimate surfaces applies to indirect contact transmission, and the objects involved were termed fomites object[9]. The fingerprinting procedure as currently used was associated with a risk of infection transmission of enteric MOs[10]. Hand hygiene has remain a general measure that significantly contributes to the prevention and control of communicable diseases; in healthcare settings, improved hand hygiene practices is reducing cross-

transmission of multidrug-resistant MOs, prevent healthcare-associated infections, and save costs. Surprisingly, during last years, very little had been done to investigate the biological basis underlying the process of bacterial transmission by hands, and particularly from the side of possible variations among individual hosts[11]. A fingertip-to-fingertip intra individual transmission experiment was carried out showed 13% exhibited a significantly higher finger-to-finger bacterial transmission efficiency[12].

Conclusions

Hands are consider as an important sources of MOs to the community, so this paper will be advising for hand hygiene perfectly for every persons, that was reflected from our simple paper research which was worked on FDDSs that often use in all companies now a day. Hand hygiene remained a general measure that significantly contributes to the prevention and control of the communicable diseases. The using of waterless hand sanitizer before the use of FDDSs, it will be decrease the MOs transmissions.

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