

Original Article

Being attendant at pediatric clinics can increase bacterial contamination risk on hands?

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Abstract

Objective: The aim of this study was to examine the bacterial growth of the attendants' hands and to determine the difference between the hospitalized and non-hospitalized attendants' hands' bacterial growth. **Materials and Methods:** In this study, the samples taken from the hands of attendants who were accompanying the hospitalized patients were examined. As a control group attendants who were not hospitalized was chosen. The samples were taken from the attendants' hands and between the fingers using the swap which was wetted by steril serum physiological. Samples were inoculated to blood agar (BA) and eosine methylene blue agar (EMB) immediately. Inoculated plates were incubated 24-48 hours at 37°C and growth was evaluated. Growth was identified using colony morphology, Gram stain, catalase and oxidase reaction. Catalaz positive bacteria were investigated for beta hemolysis, colony morphology on BA, Gram stain and microscopic appearance. Growth characteristics of Gram-negative bacilli on EMB and microscopic appearance were determined. All samples were identified by Vitec II. **Results:** All participants were women and their average age were 28.93±6.09 (min=18, max=45). It was determined that the rate of bacterial growth was 10% in case group and there was not growth in control group. The difference was statistically insignificant ($\chi^2 = 5.263$, $p = 0.056$). **Conclusions:** In conclusion, the bacterial growth on 10% of participants' hands in case group is an important and remarkable result. Being at the border of statistical difference between the two groups suggest that similar studies should be conducted with a larger sample group.

Keywords: Attendants' Hands; Bacterial Growth; Pediatric Clinics

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Introduction

Hand hygiene (HH) is the single most important and effective action to prevent the spread of health care-associated infections (HAIs) in health care settings.¹⁻⁶ HAIs can cause emotional, financial, medical troubles such as increased hospital length of stay or loss of lives and added expense.^{7,8} National action plan to prevent health care-associated infections: road map to elimination.^{1,10}

Hospitalization of children is a stressful process for both children and their parents.^{10,11} With the family-centered care that is one of the important components of pediatric nursing in the twenty-first century, it is expected to be met in the best way in the hospital children as well as their families' needs.¹² In some studies, it is stated that children staying in the hospital together with their parents have increased confidence, show faster healing process and are

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discharged earlier.^{11,13,14} However, it is extremely important to be informed of families accompanying their patient children about infection control and to pay attention to hand washing.

Although the hands of health-care providers seen as the main source of spread of infections, in recent studies the possibility of spreading of community-associated resistant strains of organisms into the health care system from the community, rather than from the health care system into the community is emphasized.^{1,15-18} The necessity of health care workers' HH compliance has been demonstrated, but the studies are needed to show the importance of attendants' HH compliance to prevent HAIs.

The aim of the current study was to examine the bacterial growth of the attendants' hands and to determine the difference between the hospitalized and non-hospitalized attendants' hands' bacterial growth.

Materials and Methods

This study was conducted in a Gowerment Hospital in Sakarya city center in Turkey in 2014. In this study, the samples taken from the hands of attendants who were accompanying the hospitalized patients were examined. As a control group attendants who were not hospitalized was chosen. In total, samples taken from the hands of 100 attendants that half of them were in case group and others were in the control group were examined. Meanwhile a questionnaire that developed by researchers was used to obtain data about socio-demographic properties and hand hygiene attitudes of participants.

The samples were taken from the attendants' hands and between the fingers using the swap which was wetted by steril serum physiological. Samples were inoculated to bood agar (BA) and eosine methylene blue agar (EMB) immediately.

Inoculated plates were incubated 24-48 hours at 37°C and growth was evaluated. Growth was identified using colony morphology, Gram stain, catalase and oxidase reaction. Catalaz positive bacteria were investigated for beta hemolysis, colony morphology on BA, Gram stain and microscopic appearance. Growth characteristics of Gram-negative bacilli on EMB and microscopic appearance were determined. All samples were identified by Vitec II.

Table 1. Identifying characteristics of the case group

| | Mean ± Sd | (Min-Max.) |
|---|-------------|------------|
| Mean age of mothers | 31.80±5.84 | 19-45 |
| Mean age of children (Months) | 31.40±38.63 | 1-202 |
| Duration of stay in hospital as attendant (days) | 2.64 ± 1.73 | 1-6 |
| Hospitalization length of stay children (days) | 3.00±1.85 | 1-7 |
| Hand washing duration of attendants (seconds) | 34.56±34.13 | 5-120 |
| Latest hand washing time before the sampling (minute) | 37.90±58.34 | 1-300 |

Ethics approval and consent to participate

Women have received information about aim of the study, confidentiality of their answers and how and where the data would be kept. Hereupon, questions of the women were responded. Written consents of volunteer women were received by asking them to fill the 'Informed Volunteer Form'.

Results and Discussion

All participants in this study were women. Identifying characteristics of the case group are shown in Table 1. Mean age of control group was 26.06±4.90 (min=18, max=38). The mean age of children was 13.54±12.96 months (min=1, max=60). Attendants' applications related to hand hygiene are given in Table 2. Only 8% (n=4) of the participants in the case group stated that they had received training about hand washing and its the importance in hospital, this ratio was 96% (n=48) in control group. 80% (n=40) of participants in the case group and 96% (n=48) in control group expressed that their hand washing frequency increased as long as they were in the hospital. Results were denoted that 74%(n=37) of participants in case group and 84% (n=42) in control group think that they wash their hands enough during their hospitalization.

It was determined that the rate of bacterial growth was 10% in case group and there was not growth in control group. The difference was statistically insignificant ($\chi^2 = 5.263$, $p = 0.056$) Table 3.

In this study, bacterial growth was observed in 10% of case group and identified as *Pasteurella pneumotropica*. Contrary to our study results, Onifade, et al. (2019) stated that the profile of gram

Table 2: Attendants' applications related to hand hygiene

| | | n | % |
|---|-----------------------------------|----|-----|
| Have your nails long? | Yes | 9 | 18 |
| | No | 41 | 82 |
| Is there lacquer/nail polish on your nails? | Yes | 0 | 0 |
| | No | 50 | 100 |
| Do you have any wounds, cuts or another problem on your hands? | Yes | 2 | 4 |
| | No | 4 | 8 |
| What do you use for hand cleaning? | Bar soap | 2 | 4 |
| | Liquid soap | 45 | 90 |
| | Soap + antiseptic | 4 | 8 |
| | Only antiseptic | 0 | 0 |
| | Only water | 2 | 4 |
| | Other | | |
| What do you use to dry your hands? | Towel | 36 | 72 |
| | Paper towel | 12 | 24 |
| | Automatic hand dryer if available | 0 | 0 |
| | No drying | 1 | 2 |
| Do you use gloves when your child care? | Never | 49 | 98 |
| | Sometime | 0 | 0 |
| | Every time | 1 | 2 |

positive bacteria profile was higher than the Gram negative bacteria in the samples taken from the hospital.¹⁹ *P. pneumotropica* is a gram-negative, oxidase positive opportunistic pathogen that is endogenous in respiratory tracts of cats, dogs and rodents and rarely isolated from humans.^{20,21}

Transmission to humans of this microorganism is thought to occur through direct contact with the animals and cause disease especially among immunocompromised.²¹⁻²³ Some reported disease conditions caused by *Pasteurella pneumotropica* are endocarditis^{23,24}, meningitis²⁵, pneumonia^{26,27}, peritonitis²⁸, sepsis²⁹, Septicemia³⁰⁻³², osteomyelitis and arthritis³³, epidural abscess³⁴. In this study, *Pasteurella pneumotropica* was observed in 10% of the samples.

Pasteurella pneumotropica growth on 10% of participants' hands in case group is an important and remarkable result. Being at the border of statistical difference between the two groups suggest that similar studies should be conducted with a larger sample group.

Table 3. Bacterial growth of samples

| Bacterial growth | Case Group | | Control Group | | The test statistic | p |
|------------------|------------|----|---------------|-----|--------------------|-------|
| | n | % | n | % | | |
| Positive | 5* | 10 | 0 | 0 | $\chi^2 = 5.263$ | 0.056 |
| Negative | 45 | 90 | 50 | 100 | | |

* *Pasteurella pneumotropica*

Conclusions

Family-centered care is important for pediatric nurses. Child patient's care is maintained in this direction starting from admission to hospital. Parents accompanying the children are encouraged to participate in the child's care. However, hospital infections are common in pediatric units than the adult unit. In these units, all personnel especially nurses must take the necessary measures relating to infection control. In this study, looking from a different angle to the incident, no more examples in the literature, that hand hygiene and bacterial growth of attendants' hands at pediatric unit were investigated and obtained remarkable results, and drawn attention to the issue.

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Conflict of interest

The authors declare that they have no completing interest.

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Authors's Contribution:

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