

How Safe Ladies Hand Bags Are: A Microbiological View

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Abstract

Introduction: Hand bag (HB) is commonly used multipurpose personal gadget of female. **Objective:** To identify the bacteria growth in HBs. **Setting:** Department of Microbiology, GSL Medical College, Rajahmundry. **Methods:** Internal area of the HB was swabbed by using a sterile swab and inoculated in blood agar, MacConkey agar and Nutrient agar. After incubation growth was identified. **Results:** Out of 320 samples growth was identified in 176 (55%) samples. Gram positive coccus was commonly isolated compared to gram negative bacilli. Out of four study groups, more number of employees hand bags were contaminated (63.75%) followed by illiterates (57.5%), post graduates (55%) and students (43.5%).

Key words:

Hand bag (HB); Gram positive cocci (GPC); Gram negative bacilli (GNB)

Introduction

Microorganisms are omnipresent. Information regarding viable pathogenic bacteria on inanimate objects had been reported by earlier investigators. Several studies have demonstrated colonization and contamination of objects such as door handles, mobile phones, money etc [1]. Majority (~80%) of infections are spread through hand contact with hands or other objects [2]. Various gram negative bacteria and gram positive cocci (GPC) were isolated from the daily used gadgets like computer, Mobile phones, Stethoscopes etc. [3].

Ladies hand bag (HB) is also another important source for the growth of microorganisms. Usually HB is one of the gadgets which are not shared or multipurpose, single use. But, due to its type of utilization we believe HBs are also an important environment for the growth of microorganisms [4].

Not only mobile phones, HBs also contain cosmetic items like face creams, lip stick, powder, partially consumed food items. In case of lactating women HBs contain fresh / used diapers, milk bottles etc. In addition to all these water bottle creates moist environment in the HB which is suitable for the growth of microorganisms. Due to speed and competitive life style, cleaning of HB is an important obstacle. Occasionally / once in a month HBs may be wiped by using wet cloth and inside dust may be removed. If HB is wet, it will be kept under the fan so that by the next day morning it will be dried and ready to use. Majority of us don't follow at least the natural sterilization method, sun light. All these may decrease the growth of microorganisms in HBs.

To our knowledge, there are no reports from developing countries on the nature and extent of colonization of microorganisms in ladies HBs. By keeping this in mind the current study is planned to identify the safety of ladies HBs in microbiological aspect.

Material and Methods

Study was conducted in Department of Microbiology, GSL Medical College and Rajahmundry. Study was approved by the institutional ethics committee and consent was taken from the volunteers who participated in the study. Women and girls who are using hand bags were included in the study. The participants were divided in to four groups: illiterates, students (studying MBBS / BPT / BSc MLT), post graduates (PGs) and employees. After collection of preliminary information like cost of the HB, duration of utilization, type of cleaning method etc by using a sterile swab the internal area of HB was swabbed by using a sterile swab and immediately samples were sent to Microbiology laboratory by placing in BHI broth as transport medium.

In the laboratory first swabs were inoculated on Blood agar (supplemented with 5% defibrinated sheep blood), MacConkey agar & Nutrient agar, plates were incubated at 37°C for 24 to 48 hours aerobically. After incubation plates were observed for growth. Initially the isolates were identified by colony morphology. All isolates were classified bases on Grams staining. GPC were identified by catalase, coagulase, and modified oxidase tests. Gram negative bacilli (GNB) were identified by Motility, Oxidase, Catalase, IMViC, Urease, Triple Sugar Iron agar, Nitrate reduction.

After identifying the bacteria, antibiotic sensitivity of isolates was done on Muller-Hinton agar (MHA) by the disk diffusion method [5]. Briefly, five colonies of each of the isolates were emulsified in Bijou bottle containing 3 ml sterile normal saline. A sterile cotton swab was dipped into the suspension and the swab was squeezed against the sides of the bottle to remove excess fluid. The inoculated swab was streaked across the surface of the MHA to get uniform lawn culture. The inoculated plates were allowed to dry for 4-5 minutes before each of the following antibiotic discs (Himedia) were placed on the plates: Ceftriaxone (30 µg), Ofloxacin (5 µg), Chloramphenicol (30 µg), Erythromycin (15 µg), Gentamycin (10 µg), Nitrofurantoin (300 µg), Tetracycline (30 µg), Cotrimoxazole (5 µg), Amoxycillin (10 µg), Pefloxacin (5 µg), Ciprofloxacin (5 µg), Methicillin (5 µg), Augmentin (12.5 µg) and Streptomycin (1 µg). The plates were incubated aerobically at 37°C for 18-24 hours. The diameters of the zones of

inhibition were measured with a scale and compared with a zone-interpretation chart [5]. *Escherichia coli* ATCC 25922 were used as the control.

Results

During the study period 80 samples were collected from each group, total 320. Out of this, 45% (144) samples were sterile and bacterial growth was seen in the remaining 55% (176) samples (Table 1). *Staphylococcus aureus* is commonly isolated bacteria followed *Staphylococcus saprophyticus*, *Escherichia coli*, *Klebsiella pneumoniae* sub species *pneumoniae*, *Proteus mirabilis*, and *Pseudomonas aeruginosa*.

Group	Name of the bacteria	Group				Total
		Illiterates	UGs	PGs	Employees	
GPC	Stap.aureus	17	18	20	18	73
	Staph. Saprophyticus	12	8	8	10	38
GNB	Esch.coli	8	0	4	9	21
	Klebsiella	5	1	5	6	17
	Pseudomonas	1	2	2	6	11
	Proteus	3	6	5	2	16
	Sterile / No growth	34	45	36	29	144
Total		80	80	80	80	320

Table 1: Growth results of the study group

Ψ^2 26.1; P = 0.09

GPC: Gram Positive Cocci

GNB: Gram Negative Bacilli

Staph.aureus: *Staphylococcus aureus*

Staph.saprophyticus: *Staphylococcus saprophyticus*

Esch.coli: *Escherichia coli*

Klebsiella: *Klebsiella pneumoniae sub species pneumonia*

Proteus: *Proteus mirabilis*

Pseudomonas: *Pseudomonas aeruginosa*

Discussion

Our study revealed that HBs contain numerous pathogenic bacteria. Out of 176 isolates GPC is predominant [63% (111)] followed by GNB [37% (65)]. Out of four study groups, highest number of pathogens were isolated from employees (63.75%), followed by illiterates (57.5%), PGs (55%) and students (43.5%).

As per the study design, employees were included in one group. This includes the employees working in GSL Medical College i.e.

faculty, nonteaching staff and patient attendants who come to GSL general hospital. In this group the cost of HB ranges from Rs 200 to 5000/-. These volunteers are aware of the disinfection methods and sterilization technique of HBs. Due to time factor they clean the outside of the HB only.

In illiterates the cost of HB is ranges between Rs 100 to 1000/-. These volunteers are not aware of HBs disinfection methods. But majority of these volunteers keep HBs in sunlight at least once in fifteen days. In the remaining study groups i.e. PGs and students, HB cost ranges between Rs 500 to 10000/-. None of these keep water bottle in HB. None of these disinfect the HB.

HB is also an important source of hospital acquired infection. Because clinicians (employees and PGs in the study group) usually keep their mobile phone and stethoscope in HB. The microorganisms present on the HB may contaminate the gadgets and infect the patients. Adding to this, mobile and stethoscope are the gadgets which are commonly shared among the colleagues. Jaya Chandra et al reported growth of nosocomial infections causing bacteria on mobiles in health care workers [6].

In the study no significant drug resistance was noticed. Microbes are sensitive to commonly used antibiotics.

Conclusion

The contamination rate of HBs in the study is 55%. However the usage of HB cannot be restricted completely in health care setup. But proper cleaning, disinfection and natural sterilization methods like sunlight drying may reduce the growth of bacteria to some extent.

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References

1. Oluduro AO, Ubani EK, Ofoezie IE (2011) Bacterial assessment of electronic hardware user interfaces in Ile-Ife, Nigeria. J. Basic Appl. Pharmaceutical Sci. 32: 323-334.
2. Al-Ghamdi AK, Abdelmalek SMA, Ashshi AM, Faidah H and Shukri H (2011) Bacterial contamination of computer keyboards and mice, elevator buttons and shopping carts. Afr. J. Microbiol. Res. 5: 3998-4003.
3. Mackie, Mac Cartney (1999) Practical Medical Microbiology: Eds. Collee JG, Fraser AG, Marnion BP Simmons A. Tests for identification of bacteria. 14th Edition. Churchill living stone publishers, UK.
4. Bailey, Scotts (2002) Diagnostic Microbiology, Eds. Karan Fabiano E. Laboratory cultivation and isolation of bacteria, methods for bacterial isolation. 11th edn. Andrew Alllen Publisher, USA.
5. **Bauer AW, Kirby WM, Sherris JC, Turck M (1966) Antibiotic susceptibility testing by a standardized single disk method. Am J Clin Pathol 45: 493-496.**
6. Jaya Chandra T, Lakshmi Prasanna T, Venkateswar Rao A (2011) A study on isolation and identification of bacteria causing nosocomial infections on mobile phones of health care workers. Calicut Med. Jour. 9: e2.