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# Bacteriological Assessment of Barber's Clipper in Barbers' Shops in Ugbowo, Benin City

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**ABSTRACT:** This study was carried out to isolate and identify bacteria associated with barbers' clipper in barbers' shops in Ugbowo, Benin City, Edo State. A total of thirty (30) barbing salon operating within Ugbowo district were randomly selected for this study. Sixty (60) samples were collected from the different shops. Sterile swab sticks were used to obtain samples from the surface of barbers' clippers and were immediately sealed to prevent contamination. Identification of isolates was done using Gram staining technique and biochemical tests. Antibiotic susceptibility test was also carried out on isolated bacteria using disc diffusion method. The result revealed the presence of *Staphylococcus aureus, Klebsiella pneumoniae*, *Escherichia coli* and *Pseudomonas aeruginosa* on barbers' clipper. *S. aureus* was the most prevalent isolate while the least distributed bacterial isolate was *K. pneumonia.* Antibacterial susceptibility test result showed that *E. coli* was resistant to all test antibiotics. *K. pneumonia* and *S. aureus* were both susceptible to streptomycin and gentamicin. *P. aeruginosa* was resistant to cephazolin, novobiocin, erythromycin and susceptible to ofloxacin and cirofloxacin. This study has shown that barbers' clipper harbour bacterial organisms which can be potentially pathogenic and may promote the spread of infection to human. It is therefore recommended that barbers must properly sterilize their hair clippers and other barbing tools before been used on their customers, in order to reduce the spread of infection.

**Keywords:** Antibiotic susceptibility, *Staphylococcus aureus*, Barbers' clipper

## Introduction

Barbers' shops are classified as personal services establishments and such services may pose potential health concerns to their clients including the risk of infection and sometimes injury (Adeleye and Osidipo, 2004; Barn and Chen, 2011). These health risks vary depending on the nature of the service, the tools and equipment that are used, the health status of the clients and service providers as well as the infection control procedures (Mbajiuka *et al.,* 2014). Therefore the equipment used may clearly be associated with bacterial, viral and fungal organisms posing infection risks (Stout *et al*., 2011).

In barbers' shops there is frequent use of blades often without proper sterilization and the clients' face and skull skin can be scratched or cut by sharp equipment during shaving and shaping of the hair (Fantahun *et al.,* 2010). In several countries shared shaving equipment in barbershops is commonly practiced. Accidental scratch by sharp equipment in barbershops may create an opportunity for microorganisms, mainly HIV and other blood borne pathogens, to enter into the body causing serious health problems to the clients (Cheesebrough, 2000).

It is believed that any service with the potential to break the skin's surface can be associated with infections which can then be transmitted to and between clients if proper infection control procedures are not implemented (Mbajiuka *et al.,* 2014). Unfortunately, there are no established regulations, guidelines and best practices for many of these salons in our environment. Therefore the aim of this study was to identify possible bacterial organisms associated

with barbers' clipper in barbers' shops located in Ugbowo locality in Benin City and to determine the antibiotics susceptibility pattern of these isolates to commercially available antibiotics.

## Materials and methods

*Study area and design*: The study was conducted among barbers and their shops in Ugbowo, Benin City. A total of thirty (30) different barbers' shops were randomly visited and sampled during the course of the study.
*Ethical consideration*: Sample collection was done after obtaining oral consent from the barbershop owners.
*Sample collection*: Sixty (60) samples were collected from the different barbers' shops. Barbers' clippers were swabbed with a moistened sterile swab stick. The swab stick was thereafter placed into its casing to avoid contamination and was labeled appropriately. All the samples collected were transported to the laboratory without delay for culture.
*Preparation of samples and serial dilutions*: The swab sticks were dipped into 90 ml of sterile 0.9 % Saline (NaCl) solution to form a stock solution. Three test tubes were prepared into which 9 ml of distilled water was pipetted. 1 ml of each homogenate sample was added into the first test tube labeled $10^{-1}$ from the prepared stock solution. Dilutions to $10^{-2}$ and $10^{-3}$ was carried out and finally 1ml was discarded from the final test tube ($10^{-3}$) to form serial dilutions (Aneja, 2005).
*Isolation and identification of bacteria*: Pour plate technique was employed for the isolation and identification of bacteria following the method describd by Adeleye and Osidipo (2004). Diluent (0.1 ml) of each serial dilution was pipetted into sterile petri dishes to which freshly prepared nutrient agar were added carefully after slightly opening the cover slide. They medium was swirled to mix properly. Once medium was solidified they were transferred into an incubator and incubated at 37 ºC for 24 h. After 24 h of incubation, the observed colonies on each culture media were subcultured on prepared MacConkey medium and incubated for another 24hrs at 37 ºC. After incubation colonies on MacConkey agar were observed for their cultural features. Gram staining and spore staining were carried out for morphological characteristics, while biochemical test including; catalase, oxidase, coagulase indole, citrate, urease, glucose and lactose fermentation tests were also used to identify the bacterial isolates.
*Antibiotic susceptibility test*: The antibiotic sensitivity test was determined using the disc diffusion method in accordance with the description of Bauer *et al.* (1966). Commercially available antibiotics disc which include: Streptomycin, Ofloxacin, Gentamicin, Ciprofloxacin, Erythromycin, Amoxicillin, Novobiocin, Cephazolin and Sulfamethoxazole were used. Mueller Hinton Agar (MHA) plates were prepared by pouring 15 ml of molten media into sterile petri plates. The plates were allowed to solidify for 5 min and 0.1 % inoculum suspension was swabbed uniformly and the inoculum was allowed to dry for 5 min. The antibiotics discs were applied on the surface of the inoculated agar plates with sterile forceps. Each disc was gently pressed down onto the agar to ensure complete contact with the agar surface; plates were incubated at 37ºC for 24 h. After incubation, the plates were examined and the diameter of the zones of inhibition was measured. Susceptibility data were interpreted according to the Clinical and Laboratory Standard Institute (CLSI, 2014).

## Results and discussion

The result of the prevalence of bacteria on barbers' clippers from the different barbers' shop is presented in table 1. *Staphylococcus aureus* (80%) was the most widely distributed bacterial isolate while *Klebsiella pneumoniae* (40%) was the least prevalent. The presence of bacteria organisms such as *Staphylococcus aureus, Klebsiella pneumoniae*, *Escherichia coli* and *Pseudomonas aeruginosa* in barbers' clipper sampled in this study conforms to the study of Mbajiuka *et al.* (2014) who isolated *Staphylococcus aureus, Streptococcus* sp. and *Micrococcus* spp. in barbers tools in their study. A similar study was carried out by Enemuor *et al.* (2012). In their study, bacterial organisms' isolated from combs, brush, clippers and apron include *Streptococcus* sp., *Staphylococcus aureus.*, *Enterococcus* sp., *Staphylococcus epidermidis* and *Enterobacterium* sp. Their findings also correlate with those obtained in this study. Bacteria such as *Staphylococcus aureus* isolated from barbers' clipper in this study has been shown to cause various pus-forming infections in humans such as boils, carbuncles, folliculitis, impetigo contagiosa and scalded-skin syndrome (Mbajiuka *et al.,* 2014). The prevalence of these bacteria on the clippers could probably be due to the use of non-potent disinfectants and sterilization technique and improper handling of barbering tools. Consequently, this study has revealed that barbering procedures and tools particularly in the study area present the risk for bacterial infections.

Table 1: Prevalence of bacteria in barbers' clippers

| | Isolate | | | |
|---|---|---|---|---|
| | ***Staphylococcus aureus*** | ***Klebsiella pneumonia*** | ***Escherichia Coli*** | ***Pseudomonas aeruginosa*** |
| Prevalence on barbers clipper | 48 (80%) | 24 (40%) | 36 (60%) | 30 (50%) |

The result for the antibiotic susceptibility pattern of bacterial isolates from barbers' clippers is given in Table 2. The results showed that *Pseudomonas aeruginosa* was resistant to cephazolin, novobiocin, erythromycin, ampicillin, amoxicillin and susceptible to streptomycin, novobiocin, gentamicin and amoxicillin. *Escherichia coli* was resistant to all test antibiotics. *Staphylococcus aureus* was resistant to cephazolin, ofloxacin, ciprofloxacin, sulfamethoxazole, novobiocin and susceptible to streptomycin and gentamycin. *Klebsiella pneumonia* on the other hand was resistant to cephazolin, ofloxacin, ciprofloxacin and sulfamethoxazole. David *et al.* (2010) suggested a way forward to controlling infection transfer in barbers shop to include calling the attention of public health workers concerned to enforce sterilization of saloon equipment nationwide. Also standard sterilization equipment such as UV sterilization chamber must be put in place in all saloons and sensitization of saloon customers of the related health hazards.

Table 2: Antibiotic susceptibility pattern of bacteria isolates from barbers' clippers

| | Antibiotics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Isolate** | **S** | **CEP** | **OFX** | **CPX** | **SXT** | **NB** | **E** | **CN** | **AMP** | **AMX** |
| *Pseudomonas aeruginosa* | I | R | S | S | I | R | R | I | R | R |
| *Escherichia coli* | R | R | R | R | R | R | R | R | R | R |
| *Klebsiella pneumonia* | S | R | R | R | R | S | I | S | I | S |
| *Staphylococcus aureus* | S | R | R | R | R | R | I | S | I | I |

**Key: -** = I = Intermediate, S = Susceptible, R = Resistance, **S** = Streptomycin, **OFX** = Ofloxacin, **CN**= Gentamicin, **CPX** = Ciprofloxacin, **E** = Erythromycin, **AMX** = Amoxicillin, **AMP** = Ampicillin, **NB** = Novobiocin, **CEP** = Cephazolin, **SXT** = Sulfamethoxazole.

## Conclusion and recommendation

This study has shown that barbers clippers harbour bacteria which can be potentially pathogenic and possibly promote the spread of infection to human. As such, barbers must sterilize their hair clippers and other barbing tools before been used on their customers, in order to reduce the spread of infection. It is recommended that enough attention should be given to the hygienic practices in barbershops through routine supervision and monitoring by agencies of the government. In addition, practical-oriented training on how to carry out decontamination with emphasis on the use of correct procedure and potent disinfectants should be organized for barbers through barbers' union and peer education approach.

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