

An Assessment of Infection Prevention and Control in Hospitals in Akwa Ibom State, Nigeria

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Abstract

Background: Infection prevention and control (IPC) programs are important in controlling healthcare associated infections (HAIs). In low and middle income countries, IPC programs targeting HCAs are frequently underdeveloped and sometimes nonexistent. **Aim:** The aim of this study was to assess and identify gaps in IPC practice across selected hospitals in Akwa Ibom State. **Methods:** This was a survey of hospitals in Akwa Ibom State in Southern Nigeria. Information for each hospital was provided by IPC representatives of each hospital through a 24 point questionnaire covering administrative controls, hand hygiene, available laboratory tests for infections, and waste disposal. **Results:** There were 25 hospitals across 15 local government areas in the state included in the survey. The average number of beds in the hospitals was 57 (6–300); the average number of wards was 6 (1–20); the average number of staff was: doctors 9 (2–40); nurses 33 (6–200); other staff 19 (3–100). There were 16 hospitals with a designated staff to oversee IPC activities, 4 with a staff dedicated to IPC activities, and one with a written IPC policy. Adequate number of hand washing stations was reported in 11 centers while 9 had regular supply of running water and 9 had regular supply of alcohol based hand sanitizers for hand hygiene. There was low capacity for onsite microbiology cultures to identify infectious agents, although most centers had HIV and hepatitis B virus rapid diagnostic test kits. **Conclusion:** There are variable levels of implementation of IPC in hospitals in Akwa Ibom State with a lack of structure, guidelines, and resources being a hindrance to high level of IPC in these hospitals.

Keywords: Akwa Ibom, infection prevention and control program, Nigeria

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INTRODUCTION

The emergence of life-threatening infections such as severe acute respiratory syndrome and re-emerging infectious diseases such as plague and tuberculosis have highlighted the need for efficient infection control programs in all health-care settings. Infection control programs consist of practices which, when used appropriately, restrict the spread of infection.^[1]

Healthcare-associated infections (HCAI) are a major cause of preventable morbidity and mortality in developing countries where infection rates are relatively higher. A 5-year review of HCAI surveillance in a tertiary hospital in southwestern Nigeria showed a prevalence of 2.3–3.1% overall and up to 5.1% in some wards.^[2] While up to 10% of hospitalized patients develop infections in developed countries every year, it has been estimated that the risk of HCAI in developing countries is 2–20 times higher than in developed countries, and more

than 40% of these infections are preventable.^[3] In developing countries, this has been attributed to poor infection control practices, lack of supervision, overcrowding in hospitals and inappropriate use of limited resources.

HCAIs prolong the duration of hospitalization, increase cost of health care and contribute to the emergence of multidrug-resistant microorganisms. These multidrug-resistant organisms from HCAIs could seed into the communities and become widespread. In general, 7% of people in developed and 10% of people in developing countries will acquire at least one HCAI in their lifetime.^[4]

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In low- and middle-income countries (LMICs), infection prevention and control (IPC) programs targeting HAIs are frequently underdeveloped and sometimes nonexistent.^[5,6] Identified barriers to implementation of IPC in LMICs include poor physical environment such as the absence of handwashing basins and presence of contaminated tap water; budgetary constraints; unreliable and inappropriate supply of equipment and supplies, including reuse of single-use items, poor storage of reprocessed items, and overuse of expensive disinfection agents; limited microbiological diagnostic facilities; lack of health-care worker (HCW) knowledge, particularly regarding transmission risks associated with poor practice; local customs and culture, including the hierarchical relationship between physicians and nurses; lack of institutional support from the hospital administration and infection control infrastructure; and poor sterilization capabilities.^[7,8]

Setting up an IPC program involves appointing a multidisciplinary IPC team to drive implementation, instituting surveillance of HCAI, and then selection of specific strategies such as hand hygiene campaign, surgical safety checklist, surgical site infection prevention care bundle, or central venous access care bundle.^[9]

The aim of this study was to assess and identify gaps in IPC practices across selected hospitals in Akwa Ibom State.

MATERIALS AND METHODS

This was a survey of hospitals in Akwa Ibom State in southern Nigeria. This state has a population of over 4 million and is divided into three senatorial districts and 31 local government areas. There are 42 government secondary hospitals and over 200 registered private hospitals in the state.

Participants were recruited during a seminar for IPC representatives in the state where 30 hospitals were represented, which were mostly government hospitals and some of the larger private hospitals in the state. Information for each hospital was provided by IPC representatives of each hospital who were participating in an IPC workshop in the capital city in July 2020. The survey instrument was a 24-point questionnaire developed by the authors covering administrative controls, hand hygiene, available laboratory tests for infections, and waste disposal.

Statistical Package for Social Science (SPSS) Statistics for Windows, Version 20.0 (Armonk, NY: IBM Corp.). Values were summarized using percentages and presented in tables and charts.

RESULTS

Of 30 questionnaires distributed, there were 25 hospitals whose representatives responded to the survey; 23 government hospitals and 2 private hospitals. These centers were in 15 local government authorities from all 3 senatorial districts of the state. The average number of beds in the hospitals was 57 (1–300); the average number of wards was 6 (1–20);

the average number of staff was: doctors 9 (2–40); nurses 33 (1–200); and other staff 19 (3–100).

Infection prevention and control organization

Of the hospitals surveyed, 64% (16/25) had a designated staff to oversee IPC activities, while only 16% (4/25) had a staff dedicated to IPC activities, and only one (4%) had a written IPC policy [Figure 1].

Hand hygiene facilities

Adequate hand washing stations (at least one station per six hospital beds) were reported in 44% (11/25) of centers. While 36% (9/25) said there was a regular supply of running water, one center reported unavailability of water, and the rest had water stored in containers. There were 19 centers (76%) that reported having liquid soap for handwashing, and others had bar soaps with one center reporting unavailability of soap for handwashing. Only 36% (9/25) of centers said that alcohol-based hand sanitizers were always available for hand hygiene [Table 1].

Waste disposal and disinfection

Most of the centers surveyed did not have color-coded bins for segregation of waste prior to disposal (76%), although majority had appropriate containers for sharps disposal (80%). An autoclave machine for decontamination of infectious waste was present in 60% (15/25) of centers [Table 2].

Availability of laboratory tests

Very few of the centers surveyed had capacity to perform microbiology cultures to identify infectious agents [Table 3]. However, most centers reported the availability of HIV/hepatitis B virus rapid tests (84%) and prophylaxis for HIV exposure (88%) [Figure 2].

DISCUSSION

Since the Ebola outbreak in 2014, there have been several efforts to improve IPC practices in hospitals in Akwa Ibom State. Our study highlighted the need for continuous monitoring of IPC in the participating health facilities. Very few of the hospitals assessed had dedicated IPC staff and fewer had a written IPC policy. This finding is similar to a study conducted across 20 tertiary hospitals in Nigeria on

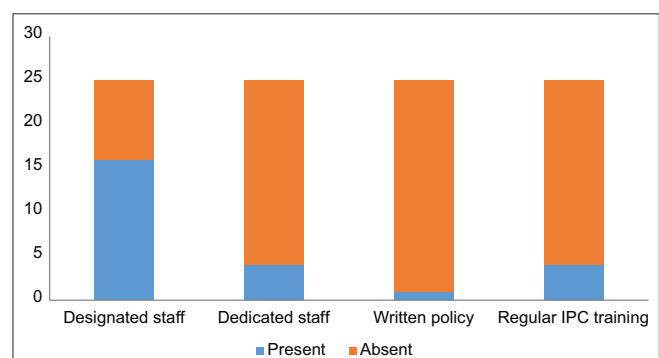


Figure 1: IPC organization, IPC: Infection prevention and control

Table 1: Hand hygiene facilities

| Item | Options | n (%) |
|---|--|-----------|
| Availability of wash stations | None | 1 (4.0) |
| | Fewer than one hand washing station per six beds | 13 (52.0) |
| | One or more hand washing station per six beds | 11 (44.0) |
| Source of water for hand hygiene | No water is usually available | 1 (4.0) |
| | Water is scooped from a basin and poured over hands | 5 (20.0) |
| | Water is usually poured over hands from a basin | 5 (20.0) |
| | Water is usually available from a cistern or container with gravity flow | 5 (20.0) |
| Type of soap available for hand hygiene | Running water from sink | 9 (36.0) |
| | No soap is available | 1 (4.0) |
| | Plain bar soap stored in a receptacle | 5 (20.0) |
| Supply of alcohol hand rubs | Liquid soap | 19 (76.0) |
| | Never sufficient | 4 (16.0) |
| | Sometimes | 9 (36.0) |
| | Usually | 3 (12.0) |
| | Always sufficient | 9 (36.0) |

Table 2: Waste disposal and disinfection

| Item | Options | n (%) |
|---|-------------------------------------|-----------|
| Availability of color-coded bins for waste disposal | Yes | 3 (12.0) |
| | No | 19 (76.0) |
| | Sometimes | 3 (12.0) |
| Containers for sharps disposal | No containers used | 2 (8.0) |
| | Nonpuncture-resistant material | 3 (12.0) |
| | Puncture-resistant sharps container | 20 (80.0) |
| Autoclave for disinfection | No | 10 (40.0) |
| | Yes | 15 (60.0) |

Table 3: Laboratory tests

| Test | Performed in hospital | Available from outside lab | Not available |
|----------------|-----------------------|----------------------------|---------------|
| Blood culture | 1 (4.0) | 8 (32.0) | 16 (64.0) |
| CSF culture | 0 (0) | 7 (28.0) | 18 (72.0) |
| Fungal culture | 1 (4.0) | 8 (32.0) | 16 (64.0) |
| Sputum culture | 8 (32.0) | 11 (44.0) | 6 (24.0) |
| Stool culture | 5 (20.0) | 14 (56.0) | 6 (24.0) |
| Urine culture | 9 (36.0) | 11 (44.0) | 5 (20.0) |
| Wound culture | 5 (20.0) | 13 (52.0) | 7 (28.0) |

CSF: Cerebrospinal fluid

antimicrobial stewardship (AMS) intervention in which only 25% had an IPC committee, and only 5% had an interface between the IPC committee and the hospital AMS program.^[10] However, increasing awareness on the importance of IPC occasioned by the negative health impact of the COVID-19 pandemic on the global health system appears to be leading to

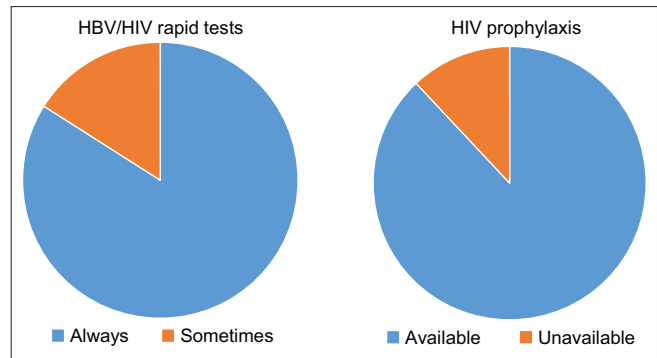


Figure 2: Availability of HBV rapid tests and HIV prophylaxis. HBV: Hepatitis B virus

a rise in IPC interventions in the Nigerian health-care system. A national survey on hospital readiness in handling COVID-19 pandemic found that 75% and 80% had trained their HCWs on IPC and provided IPC materials, respectively, though only in 50% of the hospitals were the HCWs certified to be applying standard precautions.^[11] This buttresses the need for sustained awareness on IPC measures to improve compliance.

As part of specific IPC measures implemented by the participating hospitals, the study highlighted the need to fill in gaps in hand hygiene practices. Only 44% and 36% of the health-care facilities had adequate hand wash stations and regular supply of running water, respectively. There was also low availability of alcohol-based hand rubs with only 36% having them readily available. A questionnaire-based study on knowledge gaps and level of satisfaction with hand hygiene of HCWs in a tertiary health facility present in a similar location as the participating hospitals reported nonavailability of alcohol-based hand rubs as the major reason for non-performance of hand hygiene by HCWs.^[12] A similar study carried out in the 46 clinical units of a tertiary facility in north-central Nigeria found that 87% did not have alcohol-based hand rubs while only 28% had flowing tap water all day.^[13] However, increased awareness on hand hygiene following the COVID-19 pandemic has helped in improving hand hygiene practices though such improvements need to be sustained. An assessment of hand hygiene practices among residents in a city in southern Nigeria during the COVID-19 pandemic found that 74.3% of the participants performed hand hygiene regularly with 80.6% using soap and running water as the preferred method.^[14]

Hospital waste is a potential reservoir of pathogenic microorganisms and requires appropriate, safe, and reliable handling.^[11] Although majority of centers had proper boxes for disposal of sharps, very few had appropriate bins for segregation of waste. Unsegregated waste is a potential source of HCAI among clinical and housekeeping staff. With adequate policies and protocols for waste management, good practices can be established, monitored, and enforced.

Absent or inadequate laboratory service has also been identified as a limitation to hospital IPC programs.^[9] While it is possible

to diagnose most healthcare-associated infections clinically, medical microbiology laboratory support is needed to determine etiological agents and multidrug-resistant organisms which is crucial for effective management of these cases. Onsite laboratory capacity was low among hospitals surveyed in this study. Blood, cerebrospinal fluid, and fungal cultures were not available to majority of the hospitals. This may be due to the size and location of these centers. This problem can be addressed by setting up one standard laboratory to serve a cluster of hospitals within a geographical area of a network of hospitals like government hospitals in addition to onsite laboratories for minor tests.

Some limitations of this study include the convenience sampling method used for selecting participants, possible poor recall by participants, and lack of objective direct assessment of IPC in these centers. Nonetheless, the study still gives some insight into the state of IPC and gaps that need to be addressed. Direct observation studies are needed to buttress the findings of this study.

CONCLUSION

Our study shows variable levels of implementation of IPC in hospitals in Akwa Ibom State. Lack of structure, guidelines, and resources appears to be a hindrance to high level of IPC in these hospitals. Increased allocation of resources, central coordination, and monitoring are measures that can help to improve and sustain IPC implementation in hospitals in the state.

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Conflicts of interest

There are no conflicts of interest.

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