



Nosocomial and Community Acquired Infections in Korle Bu Teaching Hospital, Accra

Nosocomial et la Communauté les Infections Acquisées dans Korle Bu En Enseignant l'Hôpital, Accra

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ABSTRACT

BACKGROUND: Nosocomial or hospital acquired infection has been recognized as a serious public health problem in the last twenty years. In most hospitals in Africa-South of the Sahara, although the types of community acquired infections are known, neither the magnitude, nor the common types of nosocomial infections has been documented.

OBJECTIVE: This study was carried out to find the prevalence of hospital and community acquired infections in hospitals, and to estimate the overall prevalence of HAI and CAI in Korle Bu Teaching Hospital.

METHODS: A one-day prevalence survey of nosocomial and community acquired infection in a tertiary-care hospital in Accra was performed using the 1980 British national protocol and the result was analyzed using computerized gargets.

RESULTS: Of the 907 patients on admission (on the day of the study), 61 (6.7%) had hospital-acquired infection and 287 (31.6%) had community acquired infection. The commonest hospital acquired infection was wound infection followed by skin and lower respiratory infections. Of the community infections, the most common cases were lower respiratory and skin infections. Fifty-three percent of all patients were on antimicrobial treatment. Patients on metronidazole were 212 (44%), ampicillin/amoxicillin 199 (41.6%), cloxacillin 163 (34%) and gentamicin 135 (28%). Approximately 20% of patients were on three or more drugs.

CONCLUSION: This study has shown that the prevalence of community acquired infections in our hospital is much higher than that from nosocomial infections and that the British national survey protocol can be used in countries with limited resources. *WAJM 2009; 28(5): 300–303.*

Keywords: Nosocomial infection, survey, prevalence, developing country.

RÉSUMÉ

CONTEXTE: nosocomiales ou infections acquises à l'hôpital a été reconnue comme un grave problème de santé publique dans les vingt dernières années. Dans la plupart des hôpitaux en Afrique au sud du Sahara, bien que les types d'infections acquises dans la collectivité sont connues, ni l'ampleur, ni les types communs d'infections nosocomiales a été documentée.

OBJECTIF: Cette étude a été menée pour trouver la prévalence de l'hôpital et la communauté des infections acquises dans les hôpitaux, et d'estimer la prévalence globale de l'HAI et CAI en Korle Bu Teaching Hospital.

MÉTHODE: Un questionnaire d'une prévalence du jour de l'infection nosocomiale et communautaire a acquis une infection dans un hôpital de soins tertiaires à Accra a été réalisée en utilisant le protocole de 1980 ressortissant britannique et le résultat a été analysée à l'aide gargets informatisés.

RÉSULTATS: Sur les 907 patients à l'admission (le jour de l'étude), 61 (6,7%) avaient des infections nosocomiales et 287 (31,6%) avaient acquises dans la collectivité infection. L'hôpital a acquis l'infection a été plus fréquente infection de la plaie suivie par la peau et les infections pulmonaires. Parmi les infections communautaires, les cas les plus fréquents étaient des voies respiratoires inférieures et les infections de la peau. Cinquante-trois pour cent de tous les patients étaient sous traitement antimicrobien. Les patients sous métronidazole, 212 (44%), l'ampicilline / amoxicilline 199 (41,6%), cloxacilline 163 (34%) et gentamicine 135 (28%). Environ 20% des patients étaient sur trois médicaments ou plus.

CONCLUSION: Cette étude a montré que la prévalence des infections acquises dans la collectivité dans notre hôpital est beaucoup plus élevé que celui des infections nosocomiales et que le protocole britannique enquête nationale peut être utilisé dans les pays à ressources limitées. *WAJM 2009; 28 (5): 300-303.*

Mots-clés: infection nosocomiale, enquête, la prévalence, les pays en développement

INTRODUCTION

Nosocomial infections or hospital-acquired infections (HAI) have been recognized as a serious public health problem in the past twenty years, but the amount of attention paid to the control of HAI in any country is related broadly to the level of provision of general health care.¹ Surveillance of HAI has become one of the most effective tools of nosocomial infection control programmes.² Several methods have been used for surveillance including analysis of ward record books, laboratory records and routine visits to wards.³ Currently, data from laboratory computers have been very useful in the collection of information and investigation of clusters of infection.⁴⁻⁶ Despite the importance of HAI, there is no clear indication of the magnitude of the problem in most African countries- south of the Sahara. Published data on HAI from Sub-Saharan Africa are mainly on outbreaks of nosocomial infection⁷⁻¹² or are related to problems with various procedures.¹³⁻¹⁴ The British national survey protocol¹⁵ have been used in several British hospitals and detailed methodology is available therefore it was selected for this survey. The purpose of this study is to estimate the overall prevalence of HAI and CAI in Korle Bu Teaching Hospital.

MATERIALS AND METHODS

In the year 2000, the Korle Bu Teaching Hospital (KBTH) a tertiary hospital in Accra, had 1500 admission beds. On 11th Mar. 2000, all patients on admission were included in the survey. Acute services made up of medicine, general surgery, neurosurgery, orthopaedics, plastic surgery, eye, ear, nose and throat, obstetrics, gynaecology, neonatal intensive care unit (NICU), paediatrics, isolation, chest unit and cardiothoracic units were included in the survey.

A team of twenty-two people including seven doctors, one pharmacist, ten nurses and five members of the Infection Control Committee of the hospital conducted the survey (with seven secretaries – as support staff). The group was divided into four smaller teams to facilitate adequate coverage of the whole hospital. The chairman of the

Infection Control Committee – a Microbiologist, instructed the team on the methodology. HAI was defined as an infection found to be active or under active treatment at the time of survey, which was not present on admission to hospital. CAI was defined as an infection present or is being incubated at admission. The protocol was similar to that of the British national survey.¹⁵ In every case, while standing around the patient, the survey team decided on clinical grounds whether the patient was infected or not. The team referred to medical and nursing records, temperature chart, and laboratory and x-ray reports and also determined whether the infection is a community acquired infection (CAI) or HAI. The only difference in the methodology (as compared to the British national survey) was that no clinical examination of patients was done.¹⁵

Every patient was reviewed by the 'survey team' on the unit with the help of the Ward sister and or the doctor on the ward. Details of all patients were collected irrespective of whether they had an infection or not. All patient information was collected that day, but some laboratory results were collected over the next few days.

DBase IV was used to capture the data and this was analyzed with the Statistical package for social science studies (SPSS) under the supervision of a statistician who was responsible for computer programming and data analysis.

The data collection was completed in 11 hours and it took one clerical staff 14 days to enter the data into the computer. Two days was required for correction of mistakes.

RESULTS

There were 907 patients on admission on the day of the survey, 576 (63.5%) of cases were females and 331 (36.5%) were males. The highest number of patients was in the obstetrics unit. As shown in Table 1, the overall rate of HAI was 61(6.7%) and CAI was 287(31.6%). The commonest of all the HAI were surgical wound infection 24(39.3%), then skin and lower respiratory infection (both) nine (14.8%) as shown in Table 2. The commonest CAI was lower respiratory infection. Some patients had both CAI and HAI therefore the total number of infections is more than the total number of infected patients in some specialties. Some patients also had more than one type of CAI.

Table 1: Distribution of Infections by Specialty

Specialty	No. (%) Of Patients	Infection Hospital-acquired No. (%)	Community-acquired No. (%)
Chest	20 (2.2)	–	21 (100)
CTU	9 (1.0)	1 (11)	1 (11)
ENT	13 (1.4)	1 (5.3)	6 (46)
EYE	6 (0.7)	–	–
Isolation	20 (2.2)	–	32 (100)
Gen. Surgery	99 (10.9)	11 (11)	34 (34)
GU	9 (1.0)	1 (11)	2 (22)
Gynaecology	74 (8.2)	3 (4)	18 (24)
Medical	79 (8.7)	7 (9)	48 (61)
Neurosurgery	26 (2.9)	–	1 (4)
NICU	25 (2.8)	5 (20)	6 (24)
Obst.(mothers)	247 (27.5)	11 (5)	16 (7)
Obst.(neonates)	31 (3.5)	–	–
Orthopaedics	138 (15.2)	13 (9)	38 (28)
Paediatrics	77 (8.5)	6 (8)	54 (70)
Paed. Surgery	15 (1.7)	–	9 (60)
Plastic Surgery	17 (1.9)	2 (12)	2 (12)
Total	907	61	287

Table 2: Types of Infections

Infected Site	Hospital-acquired	Community-acquired
Wound	24 (39.3)	22 (7.7)
Skin	9 (14.8)	50 (17.4)
Urinary tract	8 (13.1)	12 (4.2)
Lower respiratory	9 (14.8)	63 (22.0)
Upper respiratory	–	4 (1.4)
Blood	6 (3.3)	32 (11.1)
Soft tissue	2 (9.8)	18 (6.3)
Genital	1 (1.6)	19 (6.6)
Gastrointestinal	1 (1.6)	17 (5.9)
Central nervous system	1 (1.6)	26 (9.1)
Bone	–	20 (7.0)
Ear	–	2 (0.7)
Eye	–	1 (0.3)
Pyrexia of unknown origin	–	1 (0.3)
Total	61(100.0%)	287(100.0%)

There were 34 cases of community acquired *Mycobacterium tuberculosis* infections in adults in the hospital with 20 cases in the Chest Unit, six cases in isolation and 8 cases were found in other areas in the hospital.

Duration of hospital stay ranged from less than one day to 257 days. One hundred and seventeen (13.9%) of patients had been in hospital for one day or less while a total of 53.6% of patients had been on admission for between two-seven days. One patient in the orthopaedic unit had been hospitalized for 257 days.

Although there is a well equipped microbiology laboratory, most cases of HAI did not have reports for culture and sensitivity and no specimen had been sent for investigation. In the few cases where culture and sensitivity tests had been requested, the specimens were mainly from wounds and urinary tract. A total of 52.8% of all patients were receiving antimicrobial treatment. Out of these 204(42.6%) were on two drugs, and 19.5% had three or more drugs administered to them. The most common antimicrobial in use was metronidazole 212(44%), followed by ampicillin/amoxicillin 199(41.6%), gentamicin 168(34%) and cloxacillin 135(28%).

DISCUSSION

Prevalence surveys are a rapid and relatively inexpensive method of estimation of the magnitude of HAI in a

hospital. This survey shows that the prevalence of HAI in KBTH in March 2000 was 6.7% and that of CAI was 31.6%. Wound infection was the most common infection. HAI and urinary tract infection (UTI) was the fourth in rank. In most of these infected cases, no material had been sent to the microbiology laboratory for culture. This low level of microbiology investigations/reports is a problem for the diagnosis of HAI, especially UTI, because laboratory investigation is the primary source for detection of UTI. This could explain why UTI was not seen as a very common cause of HAI in this series. This low availability of microbiology reports also applies to the diagnosis of CAI and it indicates a high level of empirical treatment. Previous studies had also mentioned this lack of microbiological investigation.¹¹

The HAI prevalence of 6.7% is within the expected range of 5%–10% commonly reported from other studies.^{16–17} In England and Wales it was 9.2%,^{15,18} and the most common HAI reported were infections in the urinary and lower respiratory tracts. Gedebo *et al*¹⁹ in their Addis Ababa obstetrics and gynaecological department reported an overall prevalence of 17%, with wound infection as the most common HAI, causing 48% of infections followed by urinary

infection rate of 15%.

The high rate of CAI (31.6%) can be partly explained by the fact that, the

study population included a high proportion of children with infections, and also patients in units like Medical, Chest and Isolation wards, who were admitted with community acquired infection.

Ghana is a developing country in a tropical area and community acquired infections are very common. The overall prevalence of patients receiving antibiotic treatment was 58%. This is quite high when compared to the multi-center European study¹⁸ that reported an antibiotic usage of less than 30%. A high prevalence of patients receiving antibiotics (40%) had also been reported from Italy.²⁰ Since the cost of investigation (direct payment for laboratory tests) had been suggested as the reason for low levels of investigations especially for poor patients, it may be necessary in future to estimate the cost of investigation of infection and targeted treatment in various units as compared to this untargeted antimicrobial treatment. In hospitals with well equipped laboratories, laboratory reports could be used for surveillance. Laboratories had the advantage of measuring hospital wide occurrence of HAI from a central data point. Gross *et al*⁶ used this approach and detected approximately two thirds of nosocomial infections. Laboratories also support and assist health care providers to manage and control infectious disease.²¹ Computer analysis of positive culture rates (over a period) could be used to detect clusters of infection and even small outbreaks of infection.⁴ This can therefore act as a sensitive and time efficient method for detecting potentially preventable nosocomial infections.

This study has shown that the British national survey protocol can be used in hospitals in countries having limited resources. This is the first prevalence survey of hospital infection in a major hospital in Ghana. Studies of this nature will inform Health Ministries of the magnitude of HAI as a public health problem and also provide information for evaluating the effectiveness of infection control and prevention policies.

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