Health-care-associated infection in Africa: a systematic review

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Objective To assess the epidemiology of endemic health-care-associated infection (HAI) in Africa.
Methods Three databases (PubMed, the Cochrane Library, and the WHO regional medical database for Africa) were searched to identify studies published from 1995 to 2009 on the epidemiology of HAI in African countries. No language restriction was applied. Available abstract books of leading international infection control conferences were also searched from 2004 to 2009.
Findings The eligibility criteria for inclusion in the review were met by 19 articles, only 2 of which met the criterion of high quality. Four relevant abstracts were retrieved from the international conference literature. The hospital-wide prevalence of HAI varied between 2.5% and 14.8%; in surgical wards, the cumulative incidence ranged from 5.7% to 45.8%. The largest number of studies focused on surgical site infection, whose cumulative incidence ranged from 2.5% to 30.9%. Data on causative pathogens were available from a few studies only and highlighted the importance of Gram-negative rods, particularly in surgical site infection and ventilator-associated pneumonia.
Conclusion Limited information is available on the endemic burden of HAI in Africa, but our review reveals that its frequency is much higher than in developed countries. There is an urgent need to identify and implement feasible and sustainable approaches to strengthen HAI prevention, surveillance and control in Africa.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Health-care-associated infection (HAI) is a major global safety concern for both patients and health-care professionals.[1–3] HAI is defined as an infection occurring in a patient during the process of care in a hospital or other health-care facility that was not manifest or incubating at the time of admission. This includes infections acquired in the hospital and any other setting where patients receive health care and may appear even after discharge. HAI also includes occupational infections among facility staff.[1] These infections, often caused by multiresistant pathogens, take a heavy toll on patients and their families by causing illness, prolonged hospital stay, potential disability, excess costs and sometimes death.[4–6]

The burden of HAI is already substantial in developed countries, where it affects from 5% to 15% of hospitalized patients in regular wards and as many as 50% or more of patients in intensive care units (ICUs).[7,8] In developing countries, the magnitude of the problem remains underestimated or even unknown largely because HAI diagnosis is complex and surveillance activities to guide interventions require expertise and resources.[6] Surveillance systems exist in some developed countries and provide regular reports on national trends of endemic HAI,[9] such as the National Healthcare Safety Network of the United States of America or the German hospital infection surveillance system. This is not the case in most developing countries[10] because of social and health-care system deficiencies that are aggravated by economic problems. Additionally, overcrowding and understaffing in hospitals result in inadequate infection control practices, and a lack of infection control policies, guidelines and trained professionals also adds to the extent of the problem.

This review provides a general overview of the endemic burden of HAI in Africa based on the information available in the scientific literature. It also identifies information gaps, examines differences in HAI epidemiology between developed and developing countries and highlights the possible role of the World Health Organization (WHO) in preventing HAI.

Methods

Search strategy and selection criteria

A literature search was performed from January 1995 to December 2009 with no language restriction to retrieve publications on the epidemiology of the most common HAIs in African countries: health-care-associated urinary tract infection (HA-UTI), surgical site infection (SSI), hospital-acquired pneumonia/ventilator-associated pneumonia and health-care-associated bloodstream infection. PubMed was searched using a combination of the following keywords, including "cross-infection" as the MeSH term: "nosocomial infection", "hospital-acquired", "incidence", "prevalence" and "rate" together with the individual country names. The Cochrane Library was searched for any relevant review papers. Reference lists of retrieved articles were hand searched for additional studies.

A separate search was run in the WHO regional medical database for Africa, African Index Medicus, using a shorter list of essential keywords and with no time restriction. The abstract books of the following international conferences were also searched from 2004 to 2009: Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC), Annual Congress of the Society for Healthcare Epidemiology of America (SHEA), European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), International Federation of Infection Control

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(IFIC), the International Congress on Infectious Diseases (ICID), and the first African Conference on Infection Prevention Control (IPCAN), held in 2009. For the purposes of this review, African countries are defined as those belonging to the WHO African Region, which comprises all African countries except for Egypt, the Libyan Arab Jamahiriya, Morocco, Somalia, Sudan and Tunisia.

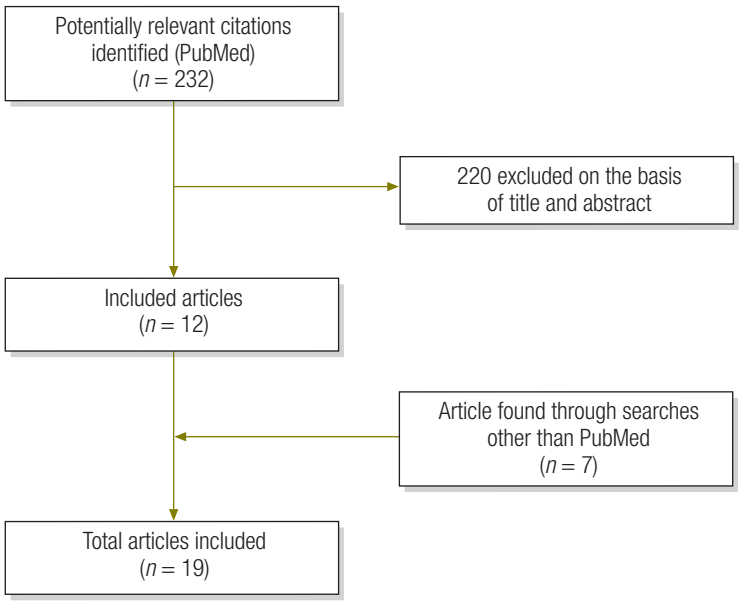
All studies examining the epidemiology, microbiology or impact of HAI (on costs, hospital stay, attributable mortality, etc.) were selected and included in the review. Reports of outbreaks were excluded. Full texts of relevant English and French articles were obtained and scrutinized. Studies were classified according to the patient population (adults, neonates/children, mixed ages) and the type of infection, stratified into five categories: general HAI (studies covering at least the four most frequent types of HAI); health-care-associated urinary tract infection; health-care-associated bloodstream infection; surgical site infection; and hospital-acquired pneumonia/ventilator-assisted pneumonia. The most recent data were used for papers reporting HAI rates from different years.[11] Prevalence, cumulative incidence and incidence densities were defined as previously described.[12]

The following predefined criteria were established to assess the quality of the studies: prospective design; use of standardized definitions (i.e. according to those of the NNIS/NHSN system of the US Centers for Disease Control and Prevention);[13] detection of at least all four major infections for studies on HAI in general; and publication in a peer-reviewed journal.

Results

The PubMed search yielded 232 papers. Of these, 12 met the eligibility criteria and were included in the review.[11,14–24] Seven additional papers were identified through other searches, (Fig. 1)[25–31] resulting in a total of 19 papers from 10 countries. No review was retrieved through the Cochrane Library. No relevant abstracts were presented at the SHEA, ECCMID, and ICID conferences between 2004 and 2009, or at IPCAN 2009. Two abstracts from the United Republic of Tanzania were included in the 2004 ICAAC abstract book, but both referred to the same published study[16] already retrieved and they were excluded. Five relevant abstracts were identified from IFIC conferences, but one did not report any HAI rate and two presented the results of the same study.

Fig. 1. **Flow diagram for systematic review of the literature on the burden of health-care-associated infection (HAI) in Africa, 1995–2009**



General study characteristics

The general characteristics of the papers are presented in Table 1. In general, hospital-wide studies were principally prevalence surveys, and those carried out in specific wards (surgical wards and ICUs) were mostly incidence studies (Table 2). HAI proportions were reported mainly as infection per 100 patients. The denominator for SSI was the number of operated patients, except for one study that used the number of operations. Two studies[16,17] were classified as high quality.

Rates and isolated pathogens

Overall rate

Hospital-wide HAI prevalence varied between 2.5% and 14.8% in Algeria,[19] Burkina Faso,[15] Senegal[14] and the United Republic of Tanzania.[11] Overall HAI cumulative incidence in surgical wards ranged from 5.7% to 45.8% in studies conducted in Ethiopia[30] and Nigeria.[20] The latter reported an incidence as high as 45.8% and an incidence density equal to 26.8 infections per 1000 patient-days in paediatric surgical patients.[20] In a study conducted in the surgical wards of two Ethiopian hospitals, the overall cumulative incidence of patients affected by HAI was 6.2% and 5.7%.[30]

Surgical site infection was the most common infection encountered in two studies investigating overall HAI incidence rates among surgical patients.[20,30] Similarly, a study from Burkina Faso on HAI prevalence among surgical patients reported surgical site infection as being the most common type, followed by urinary tract infection and hospital-acquired pneumonia.[23]

Following an intervention to prevent HAI, an Algerian study reported a decrease in HAI prevalence from 9.0% in 2001 to 4.0% in 2005 ($P < 0.001$).[11] In this study, surgical site infection was the most common type of HAI from 2002 to 2004, whereas urinary tract infections and hospital-acquired pneumonia were the most common HAIs in 2001 and 2005, respectively. In a study from Nigeria, the implementation of an infection control programme in a teaching hospital succeeded in reducing the rate of HAI from 5.8% in 2003 to 2.8% in 2006.[32]

Four studies on HAI in general included microbiological data. In one such study,[11] the isolated pathogens, by order of decreasing frequency, were *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae* and *Enterobacter* spp. Another study[15] reported *Enterobacter cloacae* as the most common pathogen followed by *E. coli*, *Staphylococcus aureus* and *P. aeruginosa*. A report on HAI cumulative incidence in surgical patients[20] showed the following distribution: *K. pneumoniae* (38.7%); *E. coli* (22.7%); *P. aeruginosa* (16.8%) and *S. aureus* (10.7%). The fourth study, which included the surgical wards of two hospitals, showed

Table 1. **General characteristics of papers retrieved in a systematic review of the literature on the burden of health-care-associated infection (HAI) in Africa**

	No. of studies	Reference
Language	13 English	14,16–18,20–22,25–30
	6 French	11,15,19,23,24,31
Country income level[a]	8 middle-income	11,15,18,20–22,24,29
	11 low-income	14,16,17,19,23,25–28,30,31
Use of CDC NHSN definitions of HAI	11 not used	14,18,19,22–24,26,28–31
	4 used	11,16,17,20
	2 modified CDC criteria used	21,27
	2 unknown	15,25
Study quality	2 high quality	16,17
	17 low quality	11,14,15,18–31
Study population	8 adult patients (3 HAI general, 4 SSI, 1 VAP)	15,16,23–27,30
	5 paediatric patients (2 HAI general, 1 SSI, 1 HAP, 1 VAP)	19–22,29
	6 mixed adult and paediatric patients (2 HAI general, 3 SSI, 1 HA-UTI)	11,14,17,18,28,31
Study scope	4 hospital-wide	11,14,18,19
	1 neonatal ICU	21
	1 paediatric ICU	22
	1 adult ICU	24
	9 single unit	16,17,20,25–29,31
	2 multiple units of a hospital	15,23
	1 multicentre	30
Type of setting	13 university/teaching hospitals	11,15,17,18,20–24,26,28–30
	2 tertiary care hospitals	14,19
	2 general hospitals	25,31
	2 district hospitals	16,27

CDC, Centers for Disease Control and Prevention; HAP, hospital-acquired pneumonia; HA-UTI, health-care-associated urinary tract infection; ICU, intensive care unit; NHSN, National Healthcare Safety Network; SSI, surgical site infection; VAP, ventilator-associated pneumonia.

[a] According to the World Bank classification based on the estimated per capita income

different microbiology patterns in the two facilities.[30]

Ten studies (eight with a focus only on surgical site infection) and three conference abstracts reported an incidence of surgical site infection ranging from 2.5% to 30.9% following various types of surgical procedures.[11,16,17,20,25–29,31,33–35] In six studies and one conference abstract,[16,17,20,26,28,29,33] elective and emergency procedures were included. One study focused on elective caesarean section only,[27] and no information on the type of surgery was available in three articles[11,25,31] and two abstracts.[34,35] In Nigeria, the cumulative incidence was 23.6 per 100 operations.[29] When reported, the incidence of surgical site infection by wound classification ranged from 6.5% to 20.2% in clean wounds, 10.1% to 23.8% in clean-contaminated wounds, 13.3% to 51.9% in contaminated wounds and 44.1% to 83.3% in dirty wounds.[17,20,25,28,29] Superficial, deep and organ/space surgical site infection accounted for 38.2% to 73%, 6.8% to 46.5%, and 10.4% to 20.5% of all surgical site infections, respectively.[16,17,20,31] In an Algerian study, the cumulative incidence of surgical site infection decreased from 11.9% in 2001 to 2.5% in 2005 ($P < 0.01$) following an infection control intervention.[11] In a survey conducted in the United Republic of Tanzania, surgical site infection was identified after discharge in 21% of patients, one third of whom were re-hospitalized because of such infection.[16] In another Tanzanian study, 19.4% of patients developed surgical site infections after surgery, and in 36.4% of these patients the problem was identified during post-discharge follow-up.[17] In a Ugandan study, the overall cumulative incidence of surgical site infection was 10% among surgical patients in general and 9.4% among women who underwent caesarean section.[25] The authors report that in this last group the figure dropped dramatically with respect to former incidence estimates (some of them higher than 50%) after the introduction of a standardized protocol for surgical wound management.[25] In a study conducted in Ethiopia, the cumulative incidence of surgical site infection was 21% based on clinical criteria and 38.7% based on bacteriological criteria in patients who had undergone abdominal surgery.[26] In a study from Kenya, the cumulative incidence of surgical site infection after caesarean section was 19% overall and 33% among women who had been in labour for more than 12 hours (versus 15% among women whose labour had lasted fewer hours).[27] In a study from the Central African Republic, three of 51 patients who developed surgical site infections were identified after discharge. Of note, only 25% of all patients who were asked to return for a follow-up visit on the 30th day after surgery actually attended.[31]

Five studies reported microbiology data on surgical site infection. In three,[16,17,26] *S. aureus* and *E. coli* were the leading pathogens recovered from infected wounds. Other reported isolates included *Klebsiella* spp, *Enterococcus* spp, *Pseudomonas* spp. and other enterobacteriaceae. A Nigerian study[29] reported *E. coli* as the most common pathogen (34.4%), followed by *Klebsiella* spp. (21.9%), *Pseudomonas* spp. (15.6%), *Staphylococcus* spp. (12.5%), *Proteus* spp. (9.4%), and *E. coli* and *Proteus* spp. (6.3%). In a study from the Central African Republic, *S. aureus*

Table 2. **Prevalence and cumulative incidence of health-care-associated infection (HAI) in African countries, 1995–2009**[a]

Year of publication	Country	Population served/hospital catchment area	Type and scope of study	No. of patients	HAI frequency (per 100 patients)	HA-UTI frequency (per 100 patients)	HAP frequency (per 100 patients)	VAP frequency (per 100 ventilated patients)	HA-BSI frequency (per 100 patients)	SSI frequency (per 100 surgical patients)
1997[25]	Uganda	–	Incidence/surgery ward	320	–	–	–	–	–	10
1998[26]	Ethiopia	195 000 urban and 3 million rural inhabitants	Incidence/surgery ward	129	–	–	–	–	–	21
1999[23]	Burkina Faso	–	Prevalence/four surgery wards	116	22.40/16.4[b]	–	–	–	–	–
2003[19]	Burkina Faso	–	Prevalence/hospital-wide	80	2.50	–	–	–	–	–
2003[14]	United Republic of Tanzania	–	Prevalence/hospital-wide	412	14.80	–	–	–	–	–
2003[17]	United Republic of Tanzania	–	Incidence/general surgery ward	396 operations on 388 patients	–	–	–	–	–	19.40
2004[20]	Nigeria	–	Incidence/surgery ward	664	45.80/26.80[c]	–	–	–	–	30.90
2005[28]	Ethiopia	–	Incidence/surgery ward	1754	–	–	–	–	–	14.80
2005[27]	Kenya	–	Incidence/obstetric ward	153 caesarean deliveries	–	–	–	–	–	19
2006[11]	Algeria	–	Prevalence/hospital-wide	297	4	0.70	1.70	–	0	2.50
2006[18]	Nigeria	Serving all the states located in the north central part of the country	Retrospective/hospital-wide	12 458 urine samples	–	12.30	–	–	–	–
2006[24]	Senegal	–	Incidence/ICU	446	–	–	–	50	–	–
2006[16]	United Republic of Tanzania	Serving a region with more than 550 000 people	Incidence/general surgery ward	613	–	–	–	–	–	23.50
2007[31]	Central African Republic	–	Incidence/orthopaedic surgery ward	278	–	–	–	–	–	18
2008[29]	Nigeria	–	Incidence/surgery ward	322	–	–	–	–	–	23.60
2008[15]	Senegal	–	Prevalence/multiple wards of a hospital	175	10.90[b]	4.50	2.90	–	–	–
2009[21]	Algeria	–	Incidence/NICU	3728	–	–	2.40/2.3[c]	–	–	–
2009[30]	Ethiopia	Millions of Ethiopians	Incidence/surgery wards of two hospitals	2223	6.19[b]/5.74[b,d]	–	–	–	–	–

ICU, intensive care unit; HA-BSI, health-care-associated bloodstream infection; HAP, hospital-acquired pneumonia; HA-UTI, health-care-associated urinary tract infection; NICU, neonatal intensive care unit; SSI, surgical site infection; VAP, ventilator-associated pneumonia.

[a] Reference[22] is excluded as it does not report infection rates. Data published in abstract form only are also excluded from this table.

[b] Infected patients per 100 patients.

[c] Infected patients per 1000 patient–days.

[d] HAI proportions from two different hospitals included in the study.

and *Proteus mirabilis* were the most common pathogens isolated from the infected surgical sites.[31]

The prevalence of urinary tract infection was 0.7% and 4.5% in two studies from Algeria and Senegal, respectively,[11,15] while a retrospective study from Nigeria reported a frequency of 12.3%.[18] The study from Algeria reported that the prevalence of UTI decreased from 3% to 0.7% in 2001 and 2005, respectively, following an infection control intervention.

The hospital-wide prevalence of hospital-acquired pneumonia was 1.7% and 2.9% in studies conducted in Algeria and in Senegal, respectively.[11,15] In another study from Algeria, the cumulative incidence of hospital-acquired pneumonia in the neonatal ICU was 2.4%.[21] No microbiology data were reported in these studies. In one Senegalese study conducted in an ICU, the proportion of ventilated patients affected by ventilator-associated pneumonia was 50%.[24]

Limited information was available on the impact of HAI in terms of cost, prolonged hospital stay and attributable mortality. In the study from the United Republic of Tanzania,[17] the mean postoperative hospital stay was 5.4 days for uninfected patients compared with 13 days for those with surgical site infection. In the study from Burkina Faso, the hospital stay was 10 days longer on average in patients with HAI.[23] A study from Ethiopia[26] reported that a delay in hospital discharge was attributable to surgical site infection in 14.7% of patients. In another Ethiopian study,[28] the mean postoperative stay was 19.6 days in patients with surgical site infection compared with 11.3 days in uninfected patients. In the same study, mortality was 4.9% overall, but 10.8% for patients with surgical site infection compared with 3.9% for patients without infection.

Discussion

The small number of papers retrieved is evidence that little information is available on the epidemiology of HAI in African countries. The review has shown that published studies were conducted in 10 African countries only. Of the 19 publications retrieved, several are from the same country. In addition, the scope of the studies is limited, since most were conducted in single hospitals or single wards. Of note, more studies may have been conducted, but not published for different reasons. Additional reports of outbreaks of HAI exist, but we focused our review on the endemic burden, which represents most HAI. Our review showed great variability in study design and in the reported prevalence and incidence of HAI. Standardized criteria and definitions for the diagnosis of HAI were not used in all studies and this may explain, at least partially, the variation in the rates of HAI. This was reflected in the overall quality of the studies (low for 17 of the 19 [88.9%] included reports) and makes any comparison with other studies difficult, particularly those from developed countries. In many cases, using standardized definitions implies the availability of reliable laboratory conditions usually lacking or poor in resource-limited settings. Patient charts and records may also be less accurate or even non-existent.

The overall prevalence of HAI ranged from 2.5% to 14.8%, up to twice as high as the average European prevalence (7.1%) reported by the European Centre for Disease Prevention and Control.[36] These findings are consistent with HAI pooled prevalence and incidence data reported from a recently published systematic review[37] on the burden of endemic HAI in developing countries (10.1%, 95% confidence interval, CI: 8.4–12.2, and 7.4%, 95% CI: 4.4–12.2, respectively). In this review, the pooled cumulative incidence and density of ICU-acquired HAI were 34.7% (95% CI: 23.6–47.7) and 47.9 per 1000 patient–days (95% CI: 36.7–59.1), respectively. This is much higher than the estimated density of 13.6 per 1000 patient–days in the United States. In a systematic review related to HAI in neonates, Zaidi and colleagues[38] reported the HAI frequency to be three to 20 times higher in resource-limited countries compared with industrialized nations.

Some important aspects need to be considered when interpreting our findings. African settings able to conduct surveillance studies and publish data may have greater resources to implement infection prevention and control programmes than those who do not collect and publish data. Thus, the real burden of HAI is likely to be even greater in settings with weaker infrastructures and fewer resources. Most included studies (13/19) were conducted in university/teaching hospitals (Table 1) that usually function as referral hospitals and accept patients requiring more complex care. For these reasons, such hospitals generally report higher infection rates. No national studies were identified and only one multicentre study in two hospitals was retrieved, which makes the difficulties of conducting coordinated and regular HAI surveillance in Africa all too clear. For all these reasons and the lack of quality previously mentioned, this review does not provide a comprehensive picture of HAI in the African continent. Instead, it provides the best overview possible while highlighting the many existing gaps.

Most papers focusing on a particular type of infection studied surgical site infection. Apart from one study reporting a cumulative incidence of surgical site infection of 2.5%, the cumulative incidence of HAI following various types of surgical procedures ranged from 10.0% to 30.9%, a rate markedly higher than in high-income countries. As an example, the average cumulative incidence rate of surgical site infection was 2.6 per 100 surgical procedures in a nationwide study conducted in the United States[39] and 3 per 100 surgical interventions in different European countries.[40] Although limited data were available on the impact of HAI, surveys conducted in surgical wards clearly documented that patients affected by surgical site infection had an increased hospital stay.[17,23,26,28]

Despite some obstacles, there are encouraging signs that the importance of HAI has started to be recognized in Africa. An Algerian study[11] documents how the introduction of a prevention programme at the facility level in 2001 reduced the overall hospital-wide prevalence of HAI over five consecutive years (2001–2005). In Uganda,[25] the implementation of a standardized protocol for surgical wound management dramatically reduced surgical site infection after caesarean section.

Importantly, infection control improvement has been undertaken nationally in some countries, such as Senegal, where a national programme to reduce HAI (*Programme national de lutte contre les infections nosocomiales* [PRONALIN]), implemented in 2004, has become a catalyst for similar programmes in other countries in the region. Tangible results, achieved with little investment, have been the establishment of infection control committees in main hospitals, national training for more than 3500 health-care workers, two national prevalence surveys on HAI, and the development of new national policies for medical waste management and antibiotic use. A na-

tional hand hygiene programme with a focus on training and advocacy has been embedded within these activities. The Infection Prevention and Control Africa Network and the *Réseau international pour la planification et l'amélioration de la qualité et de la sécurité dans les systèmes de santé en Afrique* coordinate regional and international efforts.

In 2005, WHO launched the First Global Patient Safety Challenge "Clean Care is Safer Care" to create a global momentum and commitment to reduce HAI. The objectives are to raise awareness of the importance of HAI as a major patient safety issue, build country commitment to tackle the problem, and develop tools and guidance documents. Within the development process, the WHO guidelines on hand hygiene in health care and the multimodal hand hygiene improvement strategy underwent a pilot test phase to assess their feasibility and adaptability to local contexts and to the local resources available.[41,42] Allegranzi et al.[37] reported the successful implementation and adaptation of the strategy at the test site for Africa in Bamako, Mali. The intervention consisted of introducing a locally-produced alcohol-based hand rub, monitoring hand hygiene compliance, providing performance feedback, educating staff, posting reminders in the workplace and promoting an institutional safety climate. The results clearly demonstrate that multimodal hand hygiene promotion is feasible and effective in low-income settings.[37] Other key measures for achieving basic infection control in health-care settings have been highlighted by WHO programmes: core components for infection prevention and control programmes,[43] strategies for injection[44] and blood transfusion safety,[45] safe medical waste management,[46] standards for sterilization and disinfection,[47] water and sanitation,[48] and occupational heath measures.[49]

A technical paper on patient safety detailing 12 key action areas, including the reduction of HAIs, was prepared by the WHO African Regional Office in collaboration with WHO Patient Safety and endorsed by all 46 African Member States.[50] More recently, African Partnerships for Patient Safety was launched in response to this political commitment to improve patient safety, particularly by reducing HAI, across the region.[51] The 12 key action areas form the basis of the new programme, which works through hospital partnerships between Africa and Europe with a focus on the exchange of knowledge and skills between front-line health-care professionals.[52] Each partnership is working on HAI prevention through systematic situational analyses of patient safety and focused interventions. These activities are already being taken up by national systems.

Initiatives such as those described herein demonstrate that professionals and policy-makers consider HAI a very serious problem and that simple, low-cost interventions can be successfully implemented in Africa, despite the continent's fragmented political and financial situation. These efforts need support and encouragement by WHO and other agencies and organizations. In light of the paucity of data highlighted by our review, efforts to reduce HAI should begin with surveillance activities aimed towards estimating the burden of morbidity and mortality associated with HAI. ■

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ملخص

العدوى المتعلقة بالرعاية الصحية في أفريقيا: مراجعة منهجية

الغرض تقييم وبائيات العدوى المتوطنة المتعلقة بالرعاية الصحية في أفريقيا.

الطريقة جرى البحث في ثلاث قواعد معطيات طبية (وهي النشريات الطبية PubMed، و مكتبة كوشران Cochrane Library، وقاعدة المعطيات الطبية لمنظمة الصحة العالمية الخاصة بأفريقيا)، وذلك لاستكشاف الدراسات التي نشرت خلال الفترة من 1995 حتى 2009 حول وبائيات العدوى المتعلقة بالرعاية الصحية في البلدان الأفريقية، وجرى البحث عن الدراسات المنشورة بجميع اللغات بدون تحديد. كما جرى البحث في الكتب المتوفرة للملخصات بحوث المؤتمرات الدولية الكبرى لمكافحة العدوى خلال الفترة من 2004 حتى 2009.

النتائج اجتازت 19 مقالة المواصفات المؤهلة للإدراج في المراجعة، واجتاز بحثان فقط منها معيار الجودة العالية. وأدرجت أربعة ملخصات وثيقة الصلة بالدراسة من مطبوعات المؤتمرات الدولية. وقد تباين معدل انتشار العدوى المتعلقة بالرعاية الصحية من 2.5% إلى 14.8%؛ وفي عنبر الجراحة، تراوح معدل الوقوع التراكمي من 5.7% إلى 45.8%. وركزت غالبية الدراسات على عدوى الموقع الجراحي، والتي تراوح معدل وقوعها بين 2.5% إلى 30.9%. ولم تتوفر المعطيات حول الكائنات المسببة للمرض إلا في دراسات قليلة، واتضح منها أهمية العصيّات السلبية لصبغة الغرام، ولاسيما في عدوى الموقع الجراحي، والالتهاب الرئوي المصاحب لجهاز التنفس الصناعي.

الاستنتاج لا تتوفر سوى معلومات محدودة حول عبء العدوى المستوطنة المتعلقة بالرعاية الصحية في أفريقيا، ولكن مراجعة الباحثين كشفت أن تكرار هذه العدوى أكثر بدرجة كبيرة عنه في البلدان المتطورة. وهناك حاجة ملحة لاستكشاف وتنفيذ أساليب يسيرة التطبيق ومضمونة الاستمرار لتعزيز الوقاية من العدوى المتعلقة بالرعاية الصحية، وترصدها، ومكافحتها في أفريقيا.

摘要

非洲医疗护理相关感染:系统综述

目的 旨在评估非洲地方性医疗护理相关感染的流行病学因素。

方法 我们检索了三个数据库(美国国立医学图书馆期刊文献检索系统、循证医学图书馆和世界卫生组织非洲区域医学数据库),确定1995到2009年间发表的关于非洲国家医疗护理相关感染流行病学因素的研究,检索中没有使用语言限制。同时也检索了可获取的2004到2009年间有影响力的国际感染控制会议的论文摘要集。

结果 19篇文章满足入选合格标准,其中仅有2篇文章满足高质量标准。同时,从国际会议文献中检索到4个相关摘要。全院范围内医疗护理相关感染流行率在2.5%到14.8%之间变化;其中外科病房中,累积感染发生率为5.7%-45.8%

。专注于手术部位感染的研究最多,其累积感染发生率为2.5%-30.9%。仅有几项研究提供了有关病原体数据并且强调了革兰氏阴性杆菌的重要性,特别是在手术部位感染和呼吸机相关肺炎研究中提供了上述数据。

结论 有关非洲医疗护理相关感染地方性负担的信息十分有限,然而我们的综述表明,其发生频率比发达国家要高得多。因此迫切需要确定并实施可行和可持续的方法以加强非洲医疗护理相关感染的预防、监测和控制。

Résumé

Infections liées aux soins de santé en Afrique: une étude systématique

Objectif Évaluer l'épidémiologie des infections endémiques liées aux soins de santé (IN - infection nosocomiale) en Afrique.

Méthodes Trois bases de données (PubMed, la Cochrane Library et la base de données médicale régionale de l'OMS pour l'Afrique) ont été examinées afin d'identifier les études publiées de 1995 à 2009 sur l'épidémiologie des IN dans les pays africains. Aucune restriction linguistique n'a été appliquée. Les livres des résumés de conférences internationales de premier plan sur le contrôle des infections ont également été examinés, de 2004-2009.

Résultats Les critères d'éligibilité pour l'inclusion dans l'étude ont été remplis par 19 articles, seuls 2 remplissant le critère de haute qualité. Quatre résumés pertinents ont été trouvés dans la documentation de conférence internationale. La prévalence des IN à l'échelle de l'hôpital variaient entre 2,5% et 14,8%; dans les services de chirurgie, l'incidence cumulative variait de 5,7% à 45,8%. Le plus grand nombre d'études se concentraient sur l'infection du site opératoire, dont l'incidence cumulative variait de 2,5% à 30,9%. Les données sur les agents pathogènes responsables n'étaient fournies que par quelques études et soulignaient l'importance des bacilles Gram négatif, en particulier dans l'infection du site opératoire et la pneumonie sous ventilation.

Conclusion Peu d'informations sont disponibles sur le fardeau endémique des IN en Afrique, mais notre étude révèle que sa fréquence est beaucoup plus élevée que dans les pays développés. Il y a un besoin urgent d'identifier et de mettre en œuvre des approches réalistes et durables pour renforcer la prévention, la surveillance et le contrôle des IN en Afrique.

Резюме

Инфекции, связанные с оказанием медицинской помощи, в странах Африки: систематический обзор

Цель Оценить эпидемиологию эндемичных инфекций, связанных с оказанием медицинской помощи (ИСМП), в странах Африки.

Методы Был проведен поиск по трем базам данных (PubMed, Кокрановская библиотека и региональная медицинская база данных ВОЗ по Африке) для выявления исследований, опубликованных в 1995–2009 годах, по эпидемиологии ИСМП в африканских странах. Ограничения по языку не применялись. Был также проведен поиск в сборниках резюме докладов ведущих международных конференций по инфекционному контролю за 2004–2009 годы.

Результаты Критериям включения в обзор соответствовали 19 статей, из которых только две отвечали критерию высокого качества. Из материалов международных конференций были отобраны четыре резюме на данную тему. Распространенность ИСМП на уровне больницы варьировала от 2,5 до 14,8%; в хирургических отделениях суммарная распространенность варьировала от 5,7 до 45,8%. Наибольшее число исследований фокусировались на случаях внесения инфекции в операционное поле; при этом суммарная распространенность варьировала от 2,5 до 30,9%. Данные о возбудителях инфекций содержались лишь в немногих исследованиях и подчеркивали значение грамотрицательных бактерий, особенно в случае инфекций, внесенных в операционное поле, и вентилятор-ассоциированной пневмонии.

Вывод Об эндемическом бремени ИСМП в странах Африки имеется лишь ограниченная информация, однако наш обзор показывает, что их частота значительно выше, чем в развитых странах. Существует настоятельная потребность в выявлении и внедрении применимых и устойчивых подходов к усилению мер по профилактике, слежению и борьбе с ИСМП в странах Африки.

Resumen

Infección asociada a la asistencia sanitaria en África: una revisión sistemática

Objetivo Evaluar la epidemiología de las infecciones endémicas asociadas a la asistencia sanitaria (IAA) en África.

Métodos Se examinaron tres bases de datos (PubMed, la Biblioteca de Cochrane y la base de datos médica regional para África de la OMS) con el fin de identificar estudios publicados entre 1995 y 2009 sobre epidemiología de IAA en países africanos. No se aplicó restricción alguna en cuando al idioma. También se identificaron libros de resúmenes de conferencias internacionales importantes relativas al control de infecciones que se hubieran celebrado entre 2004 y 2009.

Resultados 19 artículos cumplían los criterios de elegibilidad para su inclusión en la revisión, aunque solo 2 de ellos cumplían el criterio de alta calidad. De la literatura disponible de conferencias internacionales se recuperaron cuatro resúmenes importantes. La prevalencia hospitalaria de IAA presentaba una variación de entre el 2,5% y el 14,8%; en servicios de cirugía, la incidencia acumulada oscilaba entre el 5,7% y el 45,8%. El mayor número de estudios se centraba en la infección en el lugar en el que se practican intervenciones quirúrgicas, con una incidencia acumulada que oscilaba entre el 2,5% y el 30,9%. Solo en un pequeño número de estudios se ofrecían datos sobre los patógenos causantes y se destacaba la importancia de los bacilos Gram negativos, especialmente en la infección en el lugar en el que se practican cirugías y en la neumonía asociada al ventilador.

Conclusión Se dispone de poca información en cuanto a la carga endémica de las IAA en África, pero nuestra revisión revela que su frecuencia es mucho mayor que en países desarrollados. Existe una necesidad urgente de identificar e implementar enfoques viables y sostenibles para reforzar la prevención, la vigilancia y el control de las IAA en África.

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