identify and treat episodes of NTS bacteraemia. We already recommend parenteral antibiotics aimed at NTS in children who develop fever following transfusion for severe malarial anaemia and would consider routine use in all children with severe malarial anaemia, depending on available resources. Chloramphenicol is an appropriate choice[8,9] but the recent and rapid emergence in Blantyre of chloramphenicol-resistant *Salmonella* is a major concern.

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An audit of urine culture results at Queen Elizabeth Central Hospital (QECH) in 1994-95 and 1999-2001.

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Abstract

We conducted a retrospective audit of urine cultures at the Queen Elizabeth Central Hospital (QECH), Blantyre. The aims of the audit were to determine the common organisms cultured from urine, in 1994-5 and in 1999-2001, and the sensitivity of these organisms to the first and second line drugs used in the management of urinary tract infection (UTI) in Malawi. A total of 401 samples were studied. One hundred and thirty- six of these grew isolates that were considered pathogenic. *E. coli* was isolated in 50% of the cultures. Isolates were sensitive to cotrimoxazole and nitrofurantoin (the recommended first-line treatments in Malawi) in only 13% and 48% of cultures, and sensitive to gentamicin in 40% and augmentin in 20% of cases. Levels of drug resistance did not differ between 1994 and 2001.

Antibiotic policies for the management of UTI need to be reviewed in the light of the high isolate resistance to the two first line drugs used in the treatment of UTI in Malawi.

Introduction

The Ministry of Health in Malawi adopted an essential health package (EHP) advocated by World Health Organization (WHO). Every few years, experts from the Ministry of Health discuss which drugs to include in this package. The most recent Malawi Standard Treatment Guidelines (MSTG) recommends cotrimoxazole or nitrofurantoin for the first-line treatment of acute UTI and advises culture of urine when treatment fails. We decided to audit the urine culture records kept in the microbiology laboratory at QECH to find out if these drugs are effective in vitro.

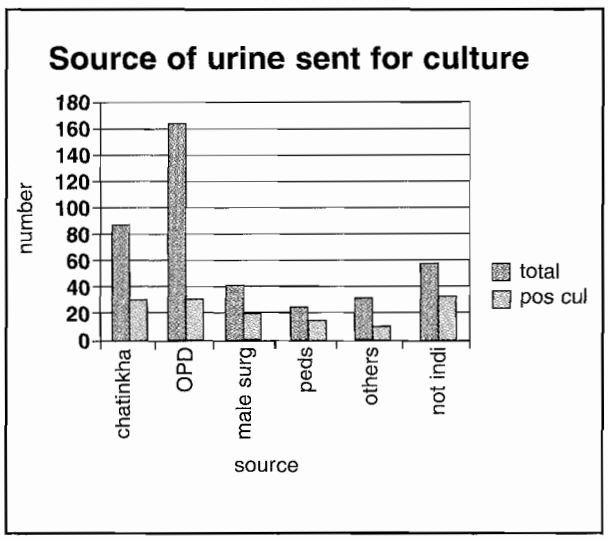
Method

This was a retrospective audit. We studied the urine culture register kept in the microbiology laboratory at QECH to look for the following information: source of the sample, age and sex of the patient and result of the cultured urine. For those samples in which an organism was isolated, we noted whether the organism was considered a contaminant or not. Those cultures with true pathogen isolates were looked at further for type of organism, and the antibiotics to which the isolate was sensitive. The audit was done at two times (September 1994 to January 1995 and January 2000 to January 2001).

Results

We looked at 401 urine samples (263 in the 1994/95 period and 136 in the 2000/2001 period). The results are presented combined because separate analysis did not show statistical significant differences. The outpatient department sent in the largest number of samples but most of positive cultures were obtained from samples of in-patients (figure 1).

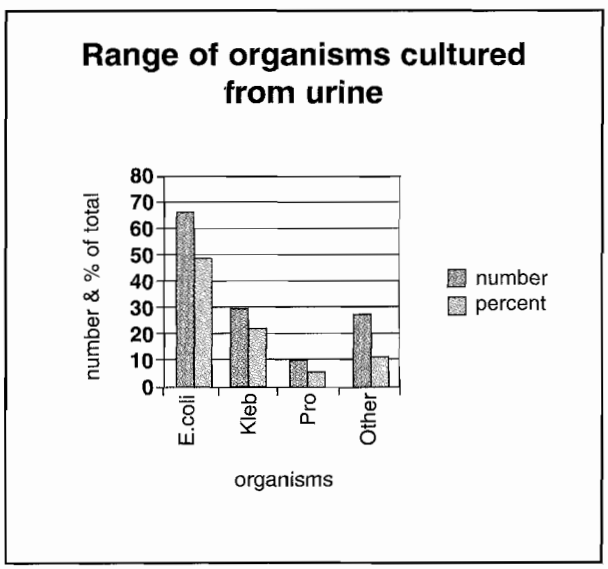
Figure 1. Source of samples for urine culture, and identification of pathogens



OPD= outpatient department
Male surg= male surgical ward
Ped = paediatric wards
Not indi= not indicated
Others= other wards within QECH

One hundred and thirty six samples (34%) grew organisms that were deemed true pathogens. E coli was the commonest isolate contributing 50% of all positive cultures (Table 2). Other organisms included group B streptococcus, Staphylococcal aureus, Pseudomonas species and Serratia species, all contributing small numbers.

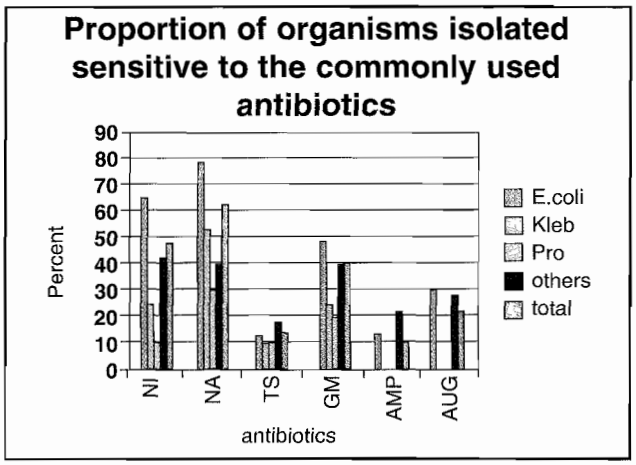
Table 2. Pathogens identified in urine samples



Kleb=Klebsiella species
Pro=Proteus species

Both cotrimoxazole and nitrofurantoin showed poor activity (13% and 48% overall sensitivity respectively) against the organisms isolated from the urine specimen. Drugs recommended as second line treatments (gentamicin and augmentin) had poor activity even against E.coli (Figure 3)

Figure 3 – drug sensitivities of isolated pathogens



NI=Nitrofurantoin
NA=nalidixic acid
TS=cotrimoxazole
GM=gentamicin
AMP=Ampicillin
AUG=augmentin

A large proportion of urine samples (57%) were not labelled for the sex and/or age of the patient. It is easy to infer sex for samples from the male surgical and Chatinkha (gynaecological& obstetrical wards) wards but not for outpatient samples.

Discussion

This audit has shown that the current antibiotics recommended for the treatment of UTI have a very high in vitro failure rate. Cotrimoxazole and nitrofurantoin fail in almost 90% and 50% of cases respectively. Even the antibiotic with the best results, nalidixic acid has an unacceptable in vitro failure rate of almost 40%. Those drugs that are recommended as second line for the treatment of UTI in Malawi (augmentin, gentamicin) have equally poor in vitro activity against the organisms isolated from urine at QECH.

Cotrimoxazole has been used extensively in this country over the years for the treatment of upper respiratory tract infections. This policy may have helped to select for resistant organism. Current surveys indicate that cotrimoxazole has high in vitro failure rate against Streptococcus pneumoniae. We do not have information about cotrimoxazole's effectiveness against other organisms causing upper respiratory tract infections.

Augmentin has not been used as extensively in public institutions in Malawi. The high in vitro failure rate for augmentin is therefore surprising. Gentamicin has been used extensively in the syndromic management of STI since early 1990s. This may have put selection pressure on organisms causing UTI. Ciprofloxacin was included in the sensitivity testing in the 1999-2001 phase (data not shown). All organisms that were tested were sensitive to ciprofloxacin. In vitro sensitivity testing has shown that ciprofloxacin is also the best drug at present for the treatment of non-typhi Salmonellae with 100% sensitivity (Wellcome Trust Laboratories, unpublished data).

This is a hospital-based audit. This is its main weakness. The audit may not truly reflect what obtains in the community. With community patients, more than 80% of acute UTI in individuals with structurally normal urinary tract is due to E coli (Sussman-1990). The distribution of causative organisms in

hospital outpatients is different but E coli still remains predominant. The same has been shown by this audit.

Data from the register lacked some useful information including age, sex and clinical information as to why a request for culture was made. All clinicians need to be reminded about the need to provide this information if meaningful analysis of data is to be made.

Conclusion

Antibiotic policy for the management of UTI need to be reviewed in view of high isolate resistance to the two first line drugs used in the treatment of UTI in Malawi.

Studies should be conducted both in the community and hospitals to establish the best antibiotics for empirical treatment of UTI in Malawi. Ciprofloxacin should be considered in hospitals as first line treatment of UTI in Malawi.

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High incidence of tuberculosis in prison officers in Zomba, Malawi

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Abstract

We conducted a study in four prisons in Zomba district, Malawi, to determine the tuberculosis case notification rate in prison officers during the year 2000. Of 201 prison staff, 9 (4.5%) were diagnosed with TB: 2 with smear-positive pulmonary tuberculosis (PTB), 4 with smear-negative PTB and 3 with extrapulmonary TB (EPTB). This incidence in prison officers (9/201) was significantly greater than the incidence in primary school teachers in a separate (unpublished) study in Malawi the previous year (78/4,289) (OR 2.58, [95%CI, 2.44 – 2.73], p <0.015). Expressed as annual TB case notification rates, the data for prison officers in these 4 prisons was 4,478 per 100,000, compared to 1,786 per 100,000 in teachers. There may be a high incidence of TB in prison officers. Further research needs to be carried out in this group to confirm these findings and to develop an occupational health service to reduce the risk of TB for these workers.

Introduction

In a survey carried out in 1996 in Zomba Central Prison, we found the prevalence of tuberculosis (TB) in convicted prisoners to be 5%1. This was much higher than the national TB prevalence in the general population. As a result of that survey, an ongoing collaboration was started between the National Tuberculosis Control Programme and the Prison Medical Service. We hold bi-annual working meetings with the aim of controlling TB amongst prisoners in Malawi. The main control strategy is the active screening of prisoners for TB on entry to prison and during their prison sentence, and the treatment of prisoners diagnosed with TB according to standardised guidelines2.

There are 23 prisons in Malawi. The number of prisons with on-site clinical staff has varied over the last 4 years from 5 to the current number of 12. In those prisons with on-site clinical staff there is a high rate of TB amongst prisoners. In the year 2000, in Zomba, Chichiri, Maula, Mzuzu and Kasungu prisons there were 17,424 convicted and remandee prisoners of whom 108 were diagnosed with smear-positive PTB, 140 with smear-negative PTB and 24 with extra-pulmonary TB (EPTB) [source = National TB Control Programme Prison meeting minutes]. Of those with smear-positive PTB, 75 (69%) had a cough for longer than 3 weeks.

Prisons may correctly be regarded as "hot spots" for TB transmission because they are over-crowded, often poorly ventilated and have a high incidence of HIV/AIDS. As such, these institutions may be a risk for prison staff as well as prisoners. There is no information in Malawi about the risk of TB in prison staff. We therefore conducted a study in 4 prisons in Zomba district to determine the annual TB case notification rate amongst prison staff, and we compared results with those obtained in primary school teachers, (the teachers' study being carried out separately and in the previous year).