INJECTION PRACTICE IN BAHIR DAR ZURIA WOREDA NORTH WESTERN ETHIOPIA

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Injection Practice - A Community Based Study

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List of Abbreviations

ARI	-	Acute Respiratory Infection
B.H.C.	-	Bahir Dar Health Center
CI	-	Confidence Interval
EPI	-	Extended Program OfImmunization
F.H.H.	-	Felege Hiwot Hospital
IM	-	Intra Muscular
inj.	-	injection
Int.	-	Intestinal
M.H.S.	-	Meshenti Health Station
Non-inj.	-	Non injection
OR	-	odds ratio
STD	-	Sexually Transmitted Disease
Subcut.	-	subcutaneous
T.H.S.	-	Tisabay Health Station
HSs	-	Health Stations

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Abstract

A study on the extent and hygienic appropriateness of injection therapy was conducted in 1380 households and four governmental health institutions in Bahir Dar Woreda, north western Ethiopia.

Systematically selected 1380 households both from the urban and rural settings and four governmental health care facilities were used as a sample to get data on injection practice from the community and health care providers.

The household survey revealed a two weeks overall prevalence of injection therapy to be 13%. The rates were comparable in the rural and urban settings. A statistically significant ($p<0.05$) higher injection treatment rate was observed among children under five. Disposable syringe and needle use was more common among the urban injection receivers.

A review of patient records revealed that 26% of the patients have received injection treatment during their visit to health institutions. Out of the four governmental health facilities observed the sterilization practice in two of them was inadequate and the safety measures during injection administration in three of them was found to be inappropriate. Refreshment course to injection providers and improvement in the supply of the necessary injection and sterilization equipment are recommended.

Introduction

For more than 60 years authors from countries all over the world have repeatedly observed the complications of injections. In recent years there has been increasing concern over the widespread misuse of injections. Numerous studies point out that injections are preferred over oral medication by patients and healers for a variety of health problems (1-2).

The public health risks resulting from the misuse of injections are very serious. The transmission of hepatitis B (HBV), human immunodeficiency virus (HIV), malarial parasites and other diseases including the spirochetes which causes syphilis, by unsterilized syringes and needles is documented in a number of studies. Sexually active groups often contract venereal diseases for which they receive injections of antibiotics. If sterilization procedures for needles and syringes are less than adequate, HIV infection may be passed to children, mothers and other types of clients seeking injections for other purposes 3-4). Some authors have well described the connection between injection and paralytic poliomyelitis (5-7). while other researchers have documented the risk of needle caused injuries and abscess (8-9).

The abuse of injections also affects the economy of households as well as the country, Poor families without sufficient income for their basic needs spend what they have on injections.Governments are spending the considerable portion of the health budget for this unnecessarily expensive form of medicine administration in spite of the fact that pills or liquids frequently would be more appropriate and carry less risk for patients (10).

These problems are especially serious in developing countries, where diseases are abundant and resources both financial and human are limited. The health infrastructure in this countries is often weak and the health personnel poorly trained and insufficiently paid for their responsibility and amount of work (10). Facilities and equipment are frequently lacking or are low quality. The number of syringes and needles may be limited and sterilization equipment not available or not functioning. If water supply and electricity are unavailable or unreliable, conditions for adequate sterilization of needles and syringes before re-use become even poorer (11).

The number of injections administered may also be affected by the attitudes of the health care personnel themselves. Health workers may indeed believe it is more effective to administer medicine in the form of an

injection, or feel that giving an injection is a good way of removing the poor compliance of patients with prescribed treatment. And it is definitely more time consuming for overworked health personnel to convince patients about the effectiveness of oral treatment than just to give the shots as requested. In a profit making health facilities, satisfying the popular demand for injections becomes even more unavoidable. In addition, a much higher price can be charged for injections than other forms of treatment (11).

The problem of inessential use of injections would not be solved if properly trained health workers refuse to provide the injections, because there are abundant informal healers who are ready to give what the patient prefers.

The desire for western- medicine, the preference for treatment at home the concentration of physicians in the urban areas,the small impact of health personnel in rural areas, and poor transportation from the rural areas to the formal facilities is mentioned to be the cardinal causes for proliferation of 'injection doctors' (12).

The avaliability of alternaytive drug to those which can be given by injection also determine the extent of injection prescription to patients (13).

While no information is available in the literature

concerning injection practice in Ethiopia, it is likely that misuse of a similar magnitude occurs here as in other developing countries. Hence,the public health risk resulting from the misuse of injections may not be less than the other developing countries.

The rapid increase in the prevalence of HIV infection has increased the concern over the possible transmission of the disease by injection with unsterile injection equipment. WHO has recommanded a study on injection practice to be undertaken in countries where the abuse of injection is identified as a problem or where HIV infection prevalence is high in order to develop an intervention strategy in the area of misuse.

Bahir Dar woreda, where this study was conducted is one of the areas in the country where the prevalence of AIDS, which can be transmitted by the use of unsterilized injection equipment, is high especially on the main town and conducting the study in the area is believed to be relevant.

Literature review

On prevalence of injection use

Research on the extent of the injection problem has so far been limited. The available studies have mentioned the abuse of injections while focusing on broader issues such as the general irrational use of allopathic drug in developing countries.

Literatures on injections described the abuse to be found in different cultural and socio-economic settings in many parts of the world. Studies from Asia have shown that there is much reason for concern in this part of the world. A survey in India showed that a third of the patients attending private general practitioners were given one or more injections, most of which were antimicrobial, vitamins or analgesics (14). Nichter's study in South India confirmed the popular belief in injections as an all powerful cure(1).

An analysis of 2953 drug prescriptions at two primary health centers in South India showed that nearly half of them contained at least one injection. From a total of 1406 injections prescribed almost 60% were for their placebo effect. 474 injections were of vitamin B-complex but none of the patients had symptoms of vitamin B deficiency (15).

A report on prescribing practices in Indonesia concluded that roughly one in every four drugs prescribed

is an injectable. Nearly one half of all infants and children received one or more injections while 75% of adults received one or more injections (16).

In the context of Africa the abuse was reported from many parts of the continent. A researcher in Zambia found that those who were educated or had travelled tended to own hypodermic syringes (6). In Uganda a survey revealed 28% prevalence of injections in the households and 60% and 68% prevalence of injections in health institutions in the weastern and eastern part of the country respectively (17).

A survey in Burkina Faso showed that young children received 78, 517, 660 and 750 injections per 1000 consultations respectively in four dispensaries (18).

Studies from Zaire, Ghana, Sierra Leone, Mozambique and Kenya have documented the strong popularity of injections in these countries and the large number of varies categories of injection providers (3, 19-22).

Why are injections popular?

Anthropologists and social scientists give varies explanations on the popularity of injections. Some researchers have explained that the low accessibility of the formal health institutions in the developing countries gives a good opportunity to informal injection providers which will be available at market places or travel to people's villages. Other researchers believe that the reason for the popularity to be the mass injection against kala-azar and yaws in the 1930s and 1950s in different parts of the world which successfully eradicate the superficial lesions after a few injections. The pain associated with injections which resembles the feeling of the piercing and cutting of the ancient treatment in many cultures is taken by some as a measure of its effectiveness (6). Depending on the culture an injection may be perceived as more effective because of its direct entry into the blood stream (11). In Tami Naddu, a state in the east coast of India, injections are very popular, about one in ten of the women had an injection in the past month for backache, stomach and chest pains etc. All the women preferred injections to pills or syrups.They believe that they feel immediately better after an injection but it takes a day or more for a pill to make them better. None would go to a doctor who did not give injections (12).

Not only the attitudes of patients but also that of health care personnel have contributed to the popularity of injections. Health workers may indeed believe it is more effective to administer medicine in the form of an injection (10).

The injection providers

In developing countries where the formal health care infrastructure and the legal enforcement system prohibiting informal health care practitioners is weak, the injection providers can be generalized into three categories; the formal injection providers, the informal injection providers and the traditional healers. Although physicians, nurses and medical assistants give some injections, the majority are probably given by druggists, paramedical workers and traditional healers who have acquired injection equipment. There is no sharp division between the formal and the informal sector. Because it is not uncommon for health workers to practice some private medicine at home in developing countries. This applies to doctors and nurses as well as to untrained workers (6).

As stated by few authors, the category of formal injection providers may include health care providers in government health care settings, and private biomedical practitioners as well as other types of health workers who have been trained to diagnose disease and decide on

appropriate treatment and administer injections.

The extent of rationality and safety of injections in the formal facilities depends on their structural and material sufficiency as well as on the effectiveness of the biomedical training which they receive in order to carry out their function. A study in Tanzania on prescription pattern showed that more injections are prescribed in dispensaries than in health centers and hospitals (13).

The informal injection providers category includes varies providers with some or no formal training and who are not officially allowed to administer injections. It is important to remember that in many developing countries these informal injection providers may be the only source of allopathic care in the more remote rural areas (12). Apart from the informal injection providers who give injection at their shops and house the travelling injection doctors constitute a special category. Cunningham in his 1970 study described in a Thailand village during the time of his survey 55% of the households visited the district health station but 76% were visited by "injection doctors". The injection doctors gather their medical knowledge from various

sources, some have been working in doctors office or have been janitors in health institutions (12).

People can also buy their injection at the pharmacies. Drugs such as chloroquine, penicillin and streptomycin as well as vitamins for injections can be bought from shops and market places. The injections may be administered by the drug vendors themselves,or by informal injectors; self administration of injections is also common in some places (6). Informal injection providers would be more valuable in case of STD and unwanted pregnancy where privacy is important and the informal injection providers can administer a 'cure' in a back room from public view or in people's own houses (10).

Traditional healers in some countries are complementing their plant remedies and rituals with allopathic drugs and the administration of injections, Surveys have shown that up to 50% of clients visiting traditional healers in certain areas of India received injections (23) and that only 14% of the traditional healers did not administer injections (24).

Sterilization of injection equipment

Although the magnitude of HIV transmission by injection is not resolved, the risk with multiple use and reuse of unsterile syringe and needles be closer to intravenous drug use (25).

The use of unsterile injection equipment in immunization programs is increasing the fear of spreading the disease to a new group. In India immunization teams were observed giving vaccines to about 40 babies using only two syringes (25). Health care providers are taught the necessity of sterile syringes and needle while they took their training. But many problems create the gap between knowledge and practice in developing countries.

In Ahmedabad, in India in 1984, 40% sterilization drums were defective and of 14,000 doctors ,5000 had no sterilizing equipments there were also 4000 unqualified doctors (11). In Burkina Faso, Africa, the use of injections at rural dispensaries was very high and from each 1000 injections the dispenseries used 14, 12, 250 syringes and 70, 120, 700 needles respectively (18). Disposable syringes are frequently used several times before they are thrown away. When the demand on injection is very high and supply of injection equipments is limited, it is likely that the sterilization is inadequate (26). The insufficiency in training and the poor payment for the amount of work they done to health care personnel in most developing countries can also contribute for the unsatisfactory sterilization (11).

In a government hospital in Sudan, a hospital which trained nurses, the staff were observed placing glass syringes and needles in a pan of sterilizer but remove

them with their fingers before a sufficient high temperature was reached, the tweezers are used to pick up dirty dressings from the floor, disposable syringes are reused indefinitely with flaming of the needle or weeping with a sprite (6).

Hazards of injectable therapy

Bacterial abscesses following injections using improperly sterilized materials are common. A health institution based study in Gabon has revealed a gluteal abscess rate of 231 per 100,000 population(27). Wyatt also explained his personal observations in India that as many as 2% of admissions to PHC hospital could be due to injection abscesses (11). Injections administered by unskilled providers can cause damage to nerves, tissues and blood vessels. Wyatt has also described that injection could increase the risk of paralysis when a child is infected with a polio virus to an incidence of 25% (28). In a study done in a tertiary care referral hospital in India using a case control study a six fold increase of acquiring acute hepatitis B infection in those injected with reusable needles than injected with sterile disposable needles and syringes was observed (26).

In Ahmedabad, India,1984 the use of unsterile blood collection apparatus and syringes and the use of infected

blood caused viral hepatitis which killed nearly 1000 people and affected another 4000 (11).

In two case control studies in Kinishasa, the greater number of injections previously received by seropositive children of seronegative mothers than those of seropositive mothers strengthens the argument that injections represent an important route of exposure to HIV infection (3).

Objective

General objective:

To determine the magnitude and appropriatness of injection practice.

Specific objectives:

- To determine the prevalence of injection.
- To describe the main diagnosis associated with injection treatment in health institutions.
- To asses the hygenic appropriatness of injections in health institutions.

Methods

1. The study area and population

The survey was carried out in the months of November and December 1994, in Bahir Dar Zuria Woreda, Eastern Gojam Zone, Region three. According to the projection made based on the 1984 population census, there are about 316,540 inhabitants in the woreda of which 40.4% live in Bahir Dar town and the rest in two small towns and 45 peasant associations(PA). One hospital, one health center and four governmental health stations give there service to the general pop[ulation in the Woreda.

Study design and Sampling

The study utilized a cross sectional design to obtain information on injection practices from both the community and the health institutions in the Woreda.

Population of Bahir Dar Zuria Woreda was the source population for the community based component of the study and all health institutions in Bahir-Dar Zuria Woreda were considered for enrolment into the study.

Since there was no data available on the prevalence from a community based study this study assumed 50% prevalence to obtain the maximum sample size with 95% certainty and a maximum discrepancy of ± 4 between the sample and the underlying population injection prevalence. Hence a sample size of 600 households were

required for each of the rural and urban population in the Woreda.

Because it was possible to get a household identification number in each kebele (Village), households in Bahir Dar town were selected systematically after determining the sampling interval according to the kebele's population size. The starting house was selected randomly. Getting the household identification number in the peasant associations was not possible. Therefore households in the peasant associations were selected by spinning a bottle at the center of the village and taking the nearest household in the direction of the neck of the bottle. Households were selected taking the interval according to the estimated number of households until the required sample size was obtained.

Only four of the six governmental health institutions providing health care service to the general population were found to be accessible for the institutional based study the excluded were Zege health station and Dekk health station since they are located on a pennusula and an island respectively and are not accessible by road transport.

3. Data collection

3.1.Community based study

A structured questionnaire was prepared to collect data from households, in order to evaluate the prevalence of injection in the community. The questionnaire was initially prepared in English and translated in to Amharic. All questions were close-ended. A pretest was conducted to find out whether it is understandable by the respondents and appropriate revision were made on the final version. Twenty secondary school graduates who participated in the recent National census in the Woreda were hired as interviewers. They received a two day theoretical and practical training on the study procedures including interviewing techniques. Then interviewers were organized into five teams and a supervisor was assigned to each team. Data were collected from a total of 1380 households. When more than one health care utilizer was found in a household, the questionnaire was filled for each of them.

3.2. Health Institutional Based Study

At the health institution level all out-patients records were collected at the end of the day and the necessary information were filled on the prepared check list. This procedure was done for one week time for each health institution by the principal researcher.

Interview with health care providers in the health institutions, and observations of the sterilization practice and injection administration were done by the researcher for two days in each health institution.

Data analysis

EPI-INFO version 5 statistical soft ware was used for data processing. Frequencies, rates and rate ratios were calculated as appropriate. Chi-square test was utilized to determine statistical significance.

Results

1. General information of the study population

A total of 1380 households were interviewed. The majority of the respondents were in the age group 30-60 years (71.1%), illiterate(62.1%), Orthodox Christians(94.9%), and Amharas(96.3%) (Table 1).

Four hundred seventy six individuals from all households were reported to having used a health care facility in the last two weeks preceding the survey. Out of these 184(38.7%) were reported to having got injection either alone or combined with oral therapy. Adults over 15 years were reported to use the health care facilities more than the others both in rural and urban settings. Overall females used health care facilities more than the males particularly in the town. The formal health care providers were consulted more than the informal sector in both settings but the rural population reported a higher use of the informal health care provider than the town population. The informal sector use rates were 44.9% and 15.7% for the rural and urban population respectively. Diarrhoea and fever were the reasons for seeking medical advise for about 50% of the cases (Table 2).

The records of 977 patients were reviewed from the four government health institutions. 22(2.3%) were not complete and were not included in the analysis.

Table 1. Characteristics of House Hold (HH) Respondents, Bahir Dar Zuria Woreda, December 1994.

Characteristics	Urban (n=600) Number(%)	Rural (n=780) Number(%)	Total
Age			
15-29	75(12.5)	230(29.5)	305(22.1)
30-44	270(45.0)	295(37.8)	565(40.9)
45-60	214(35.7)	189(24.2)	403(29.2)
Over 60	41(6.8)	66(8.5)	107(7.8)
Total	600(100.0)	780(100.0)	1380(100.0)
Sex			
Male	290(48.3)	350(44.9)	640(46.3)
Female	310(51.7)	430(55.1)	740(53.7)
Total	600(100.0)	780(100.0)	1380(100.0)
Education			
Illiterate	210(35.0)	647(82.9)	857(62.1)
Read and write	85(14.2)	107(13.7)	192(13.9)
Formal educ.	305(50.8)	26(3.3)	331(24.0)
Total	600(100.0)	780(100.0)	1380(100.0)
Religion			
Chiristian	544(90.7)	767(98.3)	1311(94.9)
Muslim	51(8.5)	12(1.5)	63(4.6)
Others	5(0.8)	1(0.3)	6(0.4)
Total	600(100.0)	780(100.0)	1380(100.0)
Ethnicity			
Amhara	550(91.7)	779(99.9)	1329(96.3)
Tigre	36(6.0)	1(0.1)	37(2.7)
Agew	6(1.0)	0(0.0)	6(0.4)
Others	8(1.3)	0(0.0)	8(0.6)
Total	600(100.0)	780(100.0)	1380(100.0)

2. Extent of injection treatment in the study population

Results of the household survey showed that in the two weeks period at least one injection was received by a member of a family in 180(13.0%) of the 1380 households visited, the results were comparable in the urban and rural settings, 12% and 13.8% respectively. When we consider only those who visited health facilities the overall prevalence raised to 38.7% (184/476), and to 74 (34.6%) and 110 (41.9%) for the urban and rural population respectively (Table 2).

Of the injections received 82.1% were therapeutic, 9.8% immunizations, 6.0% contraceptive and the remainder were infusions. Analysis of injection treatment in relation to age showed that the chances of receiving injection treatment was significantly lower among people older than 5 years as compared to the under five years children. The odds were 0.35 (95%CI 0.18, 0.68) for 5-14 age group and 0.54(95%CI 0.34, 0.87) for 15 and over. Difference in sex and residence did not show a statistically significant difference, although more females(54.4%) utilized the health care than males(45.6%) (Table 3).

Regarding the number of injections 41.4% got only one injection. Of those who received injections treatment 27% reported that they received the injections

by disposable syringe and needle while 62.7% said they were injected with syringe and needle taken out of a container. There was a considerable difference on the use of unused disposable syringes in urban and rural injection receivers. 52.7% of the urban dwellers reported that they have received the injection with unused disposable while only 9.8% of the rural ones reported so. Of those who utilized the health service 54.8% admitted that they prefer injection therapy to oral therapy.

3. The injection providers

Out of the total 184 injections 110(59.8%) were provided by the formal health care facilities while the rest by informal injection providers. The majority of the injections by the informal sector were administerd by CHAs and rural drug vendors, while the rest were provided by local injectors and formal health workers who possesed injection equipments and give services at people's home.

Table 2. Individual's Reported Illness by Age and sex, Bahir-Dar Zuria Woreda. December 1994.

Variables	Urban n=211	Rural n=265	Total n=476
Users Age			
0 - 4	39(18.5)	67(25.3)	106(22.3)
5 -14	28(13.3)	52(19.6)	80(16.8)
>15	144(68.2)	146(55.1)	290(60.9)
Users Sex			
Male	81(38.4)	136(51.3)	217(45.6)
Female	130(61.6)	129(48.7)	259(54.4)

Table 3. Illness Catigories and Treatment Received by Individuals Who Seek Medical Advise, Bahir-Dar Zuria Woreda, 1994.

Characteristics	Urban n=211	Rural n=265	Total n=476
Type of health facility			
Formal	178(84.0)	146(55.1)	324(68.1)
Informal	33(15.7)	119(44.9)	152(31.9)
Chief complaint			
Diarrhoea	27(12.8)	46(17.4)	73(15.3)
Fever	43(20.4)	122(46.0)	165(34.7)
Cough	19(9.0)	26(9.8)	45(9.5)
Abdominal cramp	12(5.7)	18(6.8)	30(6.3)
Others	110(52.1)	53(20.0)	163(34.2)
Kind of treatment			
Injection	40(19.0)	48(18.1)	88(18.5)
Injection and oral	33(15.6)	63(23.8)	96(20.2)
Oral only	127(60.2)	144(54.3)	271(56.9)
Other	11(5.2)	10(3.8)	21(4.4)

Table 4. Determinants of injection treatment, Bahir-Dar Zuria Woreda, 1994.

Variables	Treatment		OR(95%CI)
	Injection No (%)	Non-injection No(%)	
Age			
0 - 4	55 (51.9%)	51 (48.1%)	1.00*
5 - 14	22 (27.5%)	58 (72.5%)	0.35(0.18,0.6)
> 15	107 (36.9%)	183 (63.1%)	0.54(0.34,0.87)
Sex			
Male	82 (38.2%)	135 (61.8%)	1.00*
Female	102 (28.3%)	259 (71.7%)	1.07(0.73,1.58)
Religion			
Orthodox	169 (40.4%)	249 (59.6%)	1.00*
Others	14 (36.8%)	24 (63.2%)	1.16(0.56,2.45)
Residence			
Urban	74 (29.5%)	137 (70.5)	1.00*
Rural	110 (43.1%)	155 (56.9%)	1.31(0.89,1.94)
Education			
Illiterate	108 (41.7%)	151 (58.3%)	1.00*
Read&Write	33 (39.7%)	50 (60.3%)	0.95(0.59,1.55)
Formal Educ	43 (58.1%)	31 (41.9%)	0.70(0.44,1.11)
Family size			
1-4	48 (39.3%)	74 (60.7%)	1.00*
5-8	102 (39.5%)	156 (60.5%)	1.01(0.63,1.64)
9+	34 (35.4%)	62 (54.6%)	0.85(0.47,1.53)
Chief complaint			
Cough	23 (37.4%)	22 (52.6%)	1.00*
Abdominal Cramp	8 (26.6%)	22 (73.4%)	0.52(0.11,1.05)
Diarrhoea	29 (39.7%)	44 (60.3%)	0.63(0.78,1.59)
Fever	63 (38.1%)	102 (61.9%)	0.61(0.27,1.34)
Others	61 (37.4%)	102 (62.6%)	1.83(0.88,3.80)
Health care Provider			
Formal	110 (34.0%)	214 (66.0%)	1.00*
Non-formal	74 (48.7%)	88 (51.3%)	1.35(0.89,2.04)

* Referrent group

4. Results of patient's record review

The one week out-patient's record review showed that out of the 955 patients with treatment order 251(26.3%) have got at least one injection during their visit to the health institutions. Proportion of patients who received injection prescription in the different health institutions were 23.4%, 26.4%, 38.8% and 20.8% in Felege-Hiwot hospital, Bahir Dar Health center, Meshenti health station and Tisabay health station, respectively. Injection treatment prescription practices in health institutions did not show any statistically significant difference when analyzed by age and sex (Table 4).

Out of all the injection prescriptions 178 (70.6%) were antibiotics. The major antibiotics prescribed were procaine penicillin and Benzatine Penicillin. Analgesics, mainly Dipyron, Trigan and Hyoscine, accounted for 44(17.5%) of the injection (Table 5).

5. Sterilization technique in health institutions

The hospital at the time of the survey was observed using steam sterilizer for EPI syringes and needles which are sterilizable and injections other than vaccinations were given with unused disposable syringes and needles. Bahir Dar health center uses a portable steam sterilizer for EPI injection equipment and an autoclave for other syringes and needles.

The two health stations have a portable steam sterilizer which get its power source from a kerosine stove and the health workers use it only for sterilizing EPI syringes and needles. Syringes and needles used for other injection treatments are boiled in a round pan on kerosine stove.

Regarding regular power source the hospital and the health center have a regular electric power since they are located in the town, although there are times of interruption. Kerosine is supplied from the EPI program for sterilizing vaccination syringes and needles to the health institutions where there is no electric power.

Safety of Injection Administration

Except Felege Hiwot hospital which uses fresh disposable syringes and needles for a single use the other three health institutions "sterilize" or disinfect used disposable syringes and needles. Using one syringe for several injections was a common practice in the health center and health stations. All the observed health institutions except the hospital used same syringe for several injections although needles were changed after a single use. All of the health institutions were observed to dispose syringes and needles properly, they dispose either in a deep pit or burn them.

Table 5. Determinants of Injection Treatment in Government Health Care Facilities, Bahir Dar Zuria Woreda, 1994.

Variables	Treatment Inj	Non-inj	OR(95%CI)
Age			
0 - 4	57(30.8)	128(69.2%)	1.00*
5 - 14	46(37.1)	78(62.9%)	1.32(0.80,2.20)
15+	148(22.9)	498(77.1%)	0.67(0.46,0.97)
Sex			
Male	127(24.8)	366(75.2%)	1.00*
Female	130(27.8)	338(72.2%)	0.87(0.64.1.17)
Residence			
Urban	185(25.5)	541(74.5%)	1.00*
Rural	66(28.8)	163(71.2%)	0.87(0.7,1.13)
Health facility			
Felege Hiwot hosp.	73(23.4)	239(76.6%)	1.00*
Bahir-Dar H.C	131(26.4)	366(63.6%)	1.17(0.88,1.44)
Meshenti HS	38(38.8)	60(62.2%)	2.07(1.24,3.46)
Tisabay HS	10(20.8)	38(79.2%)	0.86(0.38,1.9)

* Referrent group

Table 6. Types of Injection Prescriptions by Health care Facilities, Bahir-Dar Zuria Woreda, 1994.

Type of Injection	FHH No (%)	BHC No (%)	HSs No (%)
Penicilline (IM)	34(46.6%)	93(71.0%)	26 (55.3%)
Analgesics	14(19.2%)	16(13.0%)	13 (27.7%)
Streptomycin	17(23.3%)	8(6.1%)	0 (0.0%)
Others	8(10.9%)	13(9.9%)	8 (17.0%)
Total	73(100%)	131(100%)	47 (100%)

Table 7. Illness categories treated with injections in Health Facilities, Bahir Dar Zuria Woreda, 1994.

Diagnosis	Number	Percent
Acute Respiratory Infection	77	30.7
Skin & Subcutaneous tissue infection	72	28.7
Tuberculosis(all type)	39	15.5
Malaria	14	5.6
Sexually transmitted diseases	11	4.4
Intestinal parasite & Diarrhoea	6	2.4
Others	32	12.7

Discussion

The study of injection practices particularly in the developing countries, where the HIV infection is spreading at an alarming rates, are highly valued and the World Health Organization(WHO) also recommends and encourages the conduct of such studies.

Parenteral administration of drugs is known to be one of the route of transmission for HIV infection and other fatal diseases such as hepatitis B infection in areas where sterilization of injection equipments are poor. If sterilization procedures for needles and syringes are inadequate HIV infection may pass from one infected patient to the others. Proper sterilization of injection equipments and reducing the medically unjustifiable injections could reduce the risk significantly.

In this study, the two week prevalence of injection treatment in the study community was found to be 13%. A similar study in Uganda showed the frequency of injection in a community based study to be 28% (20).

In the Uganda study antibiotics were the most frequent prescribed drugs in the form of injection which is also true in this study. The fear of AIDS by the public in Uganda has lead the society to keep its own syringe and needles at home and this has resulted in an unexpected increase in the prevalence of injection. This

might explain the high prevalence of injection practices in Uganda compared to the prevalence observed in this study (18).

The 26.3% injection prevalence in the health institutions is lower than that seen in some developing countries like Ugnada and Burkina Faso. However, most of the injections were antibiotics and used to treat illness like ARI and skin infections which could be treated effectively with oral alternatives. Hence this made most of the injections inessential and suggested the need for a uniform treatment protocol and requirement of training on essential use of drugs.

The injection treatment of under fives is considerably greater than that of the other age groups in the community based study and the health institutional based study showed a higher injection rate in children than adults. Immunization appear to be the reason for this difference in the community based study since 32.7% of the injections of under fives were vaccines while treating ARI and skin infections which are more frequently seen in children with injectable antibiotics seem the possible explanation for the higher rate seen in the health institutions. With inadequate sterilization practice the high prevalence of injection in children can possibly propagate HIV infection to a new group.

The observation that the lower level health care providers prescribe injection medications more frequently than the hospital is in agreement with the Tanzanian study which showed that the dispensaries, which are similar with our health stations, prescribe injection medications more than hospitals and health centers (13).

The sterilization capacity in the health institutions as observed in this study did not meet the minimal hygienic requirements for injection equipments. Power source for sterilization and supply of injection equipments in the health institutions, particularly at the health stations, were generally poor. These could be due to the low health budget in the country but also it could be because adequate emphasis may have not been given to it. Unless due corrective actions are taken the implications on the spread of HIV infection and other fatal diseases could be immense.

Boiling is accepted as a safe way of disinfection only if the syringes and needles are repeatedly boiled until they are used (2) but this was not the practice in the health institutions which use boiling as a sterilizing method, rather the syringes and needles were boiled only once in the morning and are kept in a container until they are used covered by a piece of gauze. The deformity following repeated resterilization of the syringes and needles is another factor which

compromises the safety of the injection administration.

Single use syringes and needles are manufactured under strictly controlled conditions. Their sterility is assured until they are in their protective packs. Their reuse is not recommended whatever sterilization technique is used. Unfortunately all the syringes and needles subjected to reuse in the study area are disposable. It clearly show that there is a big shortage in the supply of these medical equipment. Hence, one way to alleviate this shortage would be to explore ways to make reusable injection instruments available at all levels of health care together with adequate sterilization equipment.

The repeated use of a single use syringes and needles was not merely based on the actual shortage of the supplies, but also on the behavior of the injection providers who didn't recognize the danger of using a single syringe for several patients. The health authorities in the area seems to know nothing about the malpractice in the injection rooms since there is no supervisory visit to the injection rooms.

This study is believed to be internally valid since the selection of subjects follow a random procedure and the data collection was done by a trained interviewers using a uniform, closed-ended and pretested questionnaire. But it has certain limitations: generalizability could be limited to other population because of religious and cultural differences, and prescription pattern of the private and non-government health service providers were not studied.

Conclusion

The results of the community based study on the extent of injection showed a lower rate of injection treatment than some of the developing countries mentioned in the literature review. While most of the injections provided by governmental health care facilities were inessential since oral treatments could be used instead.

Considerably large proportion of injections were provided by the informal sector suggesting the poor enforcement of the low prohibiting illegal medical practice in the area.

The sterilization practice and safety of injection administration in the health institutions was found to be inappropriate and could be a dangerous source and vehicle for the transmission of fatal diseases like HIV/AIDS.

Supervision and control of safety of injection administration was found inadequate both within the institutions and by higher levels of the health authorities (district, zonal and regional health departments).

The higher use of injectable antibiotics to ARI cases in children showed recommanded treatment protocols are not followed in the health institutions.

Recommendation

1. Improvement on the supply of adequate injection and sterilization equipments are needed urgently.
2. On-job training to minimize irrational prescription of injection treatment to all levels of health workers is very essential.
3. Injection providers should receive regular supervision to insure safety of injections.
4. Preparation of a uniform treatment protocol in health facilities is needed urgently.
5. Further large scale studies to elaborate and strengthen the results of this study are recommended.

REFERENCE

1. Nichter M., The layperson's perception of medicine as perspective into the utilization of multiple therapy system in the Indian context. Soc. Sci. Med. 1980; 14B: 225-233.

2. Michell J.M. , Why do people like medicine? a perspective from Africa. Lancet. 1980; i: 210-11.

3. Mann J.M. , Risk factors for HIV seropositivity among children 1-24 months in Kinishasa, Zaire. Lancet 1986; 2: 654-657.

4. Quinn T.C. , Mann J.N., Currun J.W., Piot P. AIDS in Africa. Science. 1986; 234: 955-963.

5. Wyatt H.V., Any question? Trop. Doc. 1982; 12: 218.

6. Wyatt H.V., The popularity of injections in the Third World Origions and consequences for poliomyelitis. Soc. Sci. Med. 19: 1984; 911-915.

7. Guyer B. , Injection and paralytic poliomyelitis in Tropical Africa. Wld. Hlth. Org Bull. 1980; 58: 285-291.

8. Gerberding J.L. , Design of rational injection control policies for human immunodeficiency virus infection. J. Infect. Dis. 1987; 156: 861-864.

9. Veeken H., Verbeek J., Houlieling H., Cobehew F. Occupational HIV infection and health care workers in the Tropics. Tropical Doctor. 1991; 21: 28-31.

10. Reeler A.V.,Injections: A fatal attraction. soc. Med. 1990; 31(10): 1119-1125.

11. Wyatt H.V., Mothers, injection and poliomyelitis Soc. Sci. Med. 1992; 12: 795-798.

12. Canningham C.E., 'Injection doctors'. Soc. Sci. Med. 1970; 4: 1-24.

13. Massele A., Mwaluko G., A study of prescribing patterns at different health care facilities in Dar Es Sallam. Est. Afr. Med. J. 1994; 71(5):314-316.

14. Green H.T., Drug prescription and self medication in India. Soc. Sci. Med.1987; 25: 307-308.

15. Gitanjaly B., Unnecessary injections increase the risk of AIDS transmission. Wld. Hlth. Fom. 1993; 14(3).

16. Health Center prescribing and child survival in east Java and west Kalimanton, Indonesia. Manag. Sci. Hlth. 1988; pp 21.

17. Birungi H., Whyte S.R., Injection in uganda: Cause for concern. Essential Drug Monitor. 1994;18:11-12.

18. Ballereau F.V., Lafaix C., Haroche G., Incidence of intramuscular injection in rural dispensaries in developing countries: Trans. R. Soc. Trop. Med. Hyg., 1989; 83: 106.

19. Geest S., The illegal distribution of western medicine in Developing Countries: Med. Anthrop. 1982; 197-219.

20. Bledso C. H., Goudand M.F., The Injection and Distribution of the western pharmaceutical: an example from the Mende of Sierra Leone. Context of Medicine in Developing Countries. 1988; 253-276

21. Schapira A., Moltesen B., Mozambique: The use of drugs in the national health service. Dan. Med. Bull. Suppl. 1984; 31: 32-33.

22. Kimani V.N. The unsystematic alternative: Towards plural health care among the Kikuyu of central Kenya. Soc. Sci. Med. 1981; 15B: 333-340.

23. Alexander J.C., Shivaswamy M.K., Traditional healers in a region of Mysore. Soc. Sci. Med.1971; 5: 595-601.

24. Bhatia J.C., Vir D., Timmappya A., Chuttani C.S., Traditional healers and modern medicine Soc. Sci. Med. 1975; 9: 15-21.

25. Wyatt H.V. Injections and AIDS. Tropical Doctor. 1986; 16: 97-98.

26. Narendranathan M., Philip M., Reusable needles a major risk factor for acute virus B hepatitis. Trop. Doc. 1993; 23(2): 64-66.

27. Soetors R., Aus C. Hazards of injectable therapy. Tropical Doctor. 1989; 19: 124-126.

28. Wyatt H.V., Provocation of Poliomyelitis by multiple injections. Trans. R. Soc. Trop. Med. Hyg. 1985; 79: 355-358.

Appendix 2

Operational definitions

Formal health institutions: includes government health care settings such as hospitals, health centers, and health stations missionary health care facilities and outreach services. private clinics ran by physicians and outreach services given by governmental health care institutions.

Non-formal health sector: includes drug vendors who diagnose and give treatment, CHAs who are giving treatments out of their domain, and local injectors who give injections at their home.

Adequate sterilization: The use of a temperature of 121^{0}c for 15 minutes to sterilize equipment using sterilizer.

Disinfection by boiling: to boil injection equipment for 20 minutes after the equipment is placed in a boiling water.

Hygienic injection administration includes: the use of sterile equipment, protection of the injection fluid from contact with an aseptic substance, protection of the syringes and needles from contamination, and cleaning the injection area with appropriate disinfectant.

Appendix 3

QUESTIONNAIRE

HOUSEHOLD INFORMATION

1. Address

   Town_____ Kebele_____ House No_____

   Name of PA_____ House No_____

2. Respondent

   2.1. sex: 1. Male 2. Female

   2.2. Age_____

   2.3 Educational status

   2.3.1 Read newspaper / letter 1.Yes 2.No

   2.3.2 If Yes, last grade completed _____

   2.4 Religion: 1. Orthodox Christian
   2. Muslim
   3. Other

   2.5 Ethnicity: 1. Amhara 2.Tigre 3. Agew
   4. Others

3. Number of household members_____

4. Number of children in the household_____

5. Is there any member of the family who has sought any health care in the last two weeks?

   1. yes_____ continue the next section

   2. No_____ end here

6. Health care utilizer

6.1 age_____

6.2 sex 1. Male 2. Female

7. Where do you get the health care?

1. in a health facility

2. at the provider's house } skip to 9

3. at home }

8. To which health care facility s / he went?

1. hospital 2. health center

3. health station

4. health post 5. private clinic

6. NGO clinic

7. drug vendor 8. traditional healer

9. individual who gives treatment at home

10. out-reach EPI site

9. Who visited the house?

1. A formal health worker

2. non-formal health care provider

3. CHA 4. TTBA 5. Others(specify)

10. Chief complaint

1. Diarrhoea 2. Fever

3. Cough 4. Abdominal cramp 5. Others

11. Did you request for a specific treatment

1. Yes 2. No (if no skip to 13)

12. If yes did you get what you request?

1. Yes 2. No

13. What kind of treatment did you get?

1. injection 2. injection + oral

3. oral 4. other (specify)

14. What kind of injection did you get?

1. therapeutic (small volume)

2. infusion (large volume)

3. immunization 4. contraceptive

15. Did you get more than one injection?

1. Yes 2. No (if no skip to 17)

16. Number of injections received _____ 17. Where did you take the other injections?

1. same institution 2. nearby health institution

3. local injector 4. other (specify)

18. Did you received the injections with packed syringe and needle?

1. Yes (skip to 21) 2. No

19. Were you asked to buy a packed one?

1. Yes 2. No(skip to 21)

20. Why didn't you buy?

1. it was expensive 2. not available

3. do not know the advantage

4. other (specify)

21. What type of treatment do you prefer?

1. injection 2. injection + oral

3. oral only 4. other (specify)

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in any other university and that all resources of material used for this thesis have been fully acknowledged.

Name: DEREJE HAILE

Signature: _____

Place: Addis Ababa, Ethiopia

Date of submission: May 1995