Interactional group discussion: an intervention to reduce overuse of injections in rural public health care facilities, North 24 Parganas district, India, 2007

By

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Ambattur, Chennai

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CERTIFICATION

This is to certify that this dissertation, titled '**interactional group discussion: an intervention to reduce overuse of injections in rural public health care facilities, North 24 Parganas district, India, 2007**', submitted by **Dr. Rama Bhunia**, in partial fulfillment of the requirements for the degree of Master of Applied Epidemiology, is the original work done by her and has not been submitted earlier, in part or whole, for any other publication or degree.

Date: ২৭-০২-২০০৪

DIRECTOR

TABLE OF CONTENTS

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PREFACE

Injection overuse is a public health problem in West Bengal. My dissertation work is an intervention study to reduce injection overuse and knowledge attitude and practice survey regarding injection safety among medical officers working in rural public health care facilities in North 24 Parganas district, West Bengal, India, 2007. I have done pre and post intervention prescription survey in North 24 Parganas district. The intervention is interactional group discussion between medical officers and common people. I have presented the effectiveness of interactional group discussion to reduce overuse of injections and knowledge attitude and practice regarding injection safety among medical officers working in rural public health care facilities.

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Introduction

Injection is a common health care procedure. [1, 2] In 2000, the World Health Organization estimated that in transitional and developing countries, 16 billion injections were given, for a ratio of 3.4 injections per person and per year. [1, 3] Of these, 95% were therapeutic injections and 40% were unsafe.[3] Therapeutic injections were unnecessarily used for many medical purposes, including diarrhea, fever, cold, weakness and pain.[2, 4] In industrialized countries, the use of one sterile syringe and needle for each patient reduced bloodborne pathogen transmission through injections in the mid twentieth century.[4] As a result, in 2000, in these countries, bloodborne pathogen transmission through injections was mostly limited to health care workers exposed to needle-stick injuries and injecting drug users. [4] In contrast, in 2000, in developing and transitional countries, WHO estimated that 40% new hepatitis C virus infections, 30% new hepatitis B virus infection and 2% of new HIV infections were attributable to unsafe health care injections. [3] These infections led to a burden of chronic liver diseases and AIDS, causing an estimated 283,000 early future deaths for 9,177,679 discounted and age-weighted DALYs, between 2000 and 2030, respectively.[5] To prevent the burden of disease associated with unsafe health care injections, WHO recommends a strategy based upon (1) behavioural change among patients and health care personnel to reduce injection overuse and achieve safety, (2) provision of injection equipment and supplies and (3) health care waste

management. [3]A number of reports indicated that selected behaviour change strategies, including "interactional group discussions" between patients and prescribers may be effective at decreasing injection overuse.[6, 7] Overall, interactional group discussion and using single use injection equipment may lead to a reduction of 8,856,461 DALYs with a cost effectiveness ratio under the threshold of three gross domestic product per capita per DALY averted.[5]

Reports have suggested that patients prefer injections for the administration of medications.[8, 9]However, qualitative research suggest that prescribers overestimate the preference for injections among patients, and that in most cases, patients are open to the use of oral medications.[10] In fact, misunderstandings between prescribers and patients contribute to injection overuse.[11] In 1992, an intervention study conducted in Indonesia, in collaboration with the International Network for the Rational Use of Drugs (INRUD) suggested that when physicians are confronted with the actual absence of preference for injections among patients, they can alter their prescription practices and reduce injection overuse.[12] On the basis of the experience from Indonesia, the World Health Organization designed an intervention guide that could be applied to different countries facing injection overuse. [11] As a result, interactional group discussion interventions were conducted in Karachi, Pakistan (among general practitioners in the informal private sector), [13] in referral hospitals in Cambodia [14] and in primary health care facilities in Tanzania. [15] While the results of the intervention in Tanzania was difficult to interpret as it was not consistent with the WHO guide, the studies in Pakistan and in Cambodia supported the hypothesis that interactional group discussions were effective to reduce overuse of injections in both the public and the private health sectors.

In India, as in many other countries, many therapeutic injections are unnecessary and unsafe. [16-23] In 2003, the Indian Clinical Epidemiology Network (India CLEN) assessed injection practices in collaboration with the Ministry of Health and Family Welfare and the World Bank. [16] In rural area, the annual ratio of injections received per person and per year were 6.1 and 3 when two weeks' and three month's recall periods were used, respectively. 83% of these injections were given for therapeutic purposes. While 74% of patients reported preferring injections, 44% of also reported accepting doctors' decisions for the choice of a route of administration. In addition to being overused, injections were also unsafe in 69% of government health care facilities. Overall, the IndiaCLEN study recommended communication for behaviour change among health care professionals and community to reduce injection overuse, along with other interventions to increase safety. [16] In the "zone four" of the India CLEN study that included the state of West Bengal, the number of injections per person and per year was 2.1 and 1.7, for the two week and three month recall period, respectively. In rural areas, the community survey indicated that only 53% of the last injections were given using a plastic syringe opened from a fresh packet. Since unsafe and unnecessary use of injections were present in West Bengal and interactional group discussion was reported effective in reducing injection overuse in other settings, we conducted a study to determine whether interactional group discussions could also be effective at reducing injection use in West Bengal.

Methods

Study population

We defined the study population as medical officers working in 2007 in government rural health care facilities in the "North 24 Parganas" district, West Bengal, India.

Study design

We conducted a randomized controlled trial. The study consisted of three stages: (1) a pre-intervention prescription survey, (2) the interactional group discussion intervention with doctors and community members and (3) a post intervention prescription survey. The outpatient prescriptions survey estimated the frequency of injection practice using the WHO standardized OT8 indicator (i.e., the number of prescriptions including at least one injection) and the ratio of injections per 100 prescriptions. We conducted prescription surveys before the intervention for both the control and the intervention groups, conducted the intervention four weeks after the survey, and then surveyed prescriptions again two months after the intervention. To assess the impact of the intervention, we also surveyed all medical officers working in the public rural health care facilities of the district following the intervention to compare the knowledge, attitudes and practices of medical officers among those who had been exposed to the intervention and others.

Principle

The principle of the intervention was to make use of the dynamic of the discussion between patients and providers to confront medical officers with the actual lack of preference for injections in the population.

Practical organization

The session regrouped a facilitator (i.e., a district level public health specialist) a resource person (i.e., a pharmacologist or any other person who could state that oral medicines were equivalent to injections in most cases), six medical officers and six community members (including mothers of young children). We chose a conference or meeting hall or hall as a neutral venue. The discussion lasted two hours and was followed by tea. Local authorities and leaders recruited influential community members aged 20 years or more to attend the session.

Discussions

During the session, patients and medical officers discussed their views on injections with the assistance of the facilitator. The referent resource person provided scientific knowledge about unsafe and unnecessary use of injections when required. In practice, the facilitator first introduced the subject, explained the impact of injection overuse, described unsafe injection practices and its relation to diseases and provided scientific evidence to document the similar effectiveness of injections and pills. The resource person then further documented the equivalent effectiveness of oral treatment and injections in

most usual situations. The facilitator mentioned the possibility of a discrepancy between the medical officers' beliefs and the attitude of the community in terms of preference for injections and facilitated a discussion between community members and medical officers on the subject for 90 minutes. The facilitator resolved conflicts that arose by deferring the topic to the resource person. As a conclusion, the facilitator invited all participants to formulate a consensus statement that included mentions of unnecessary and dangerous use of injections and the risks of injection use to specify that oral drugs were sufficient in most cases. Medical officers pledged to ask patients whether they would agree to take oral medications instead of injections. Community members pledged to disseminate the information about the risk of injections. We distributed the materials used to the participants.

Sampling procedure

Interactional group discussion intervention and control groups

We used the list of medical officers working in rural health care facilities (i.e., block primary health centre and primary health centre) as sampling frame (N=135). Among those, we selected 72 medical officers at random (36 medical officers in both the intervention and control groups). We calculated the sample size on the basis of the number of prescriptions to be analyzed before and after the intervention, using the Epi Table Software. Our assumptions included (1) a proportion of prescriptions including at least one injection of 50% and 40% before and after the intervention, respectively; an alpha risk of 5% and a power of 99%. As the software generated an estimate of 925, we anticipated 5% of non-response and therefore aimed at surveying 971 prescriptions before and after, for the intervention and the control group.

To round up and obtain an even count, we included every third prescription on the day of the survey until we had 30 prescriptions for each of the 36 medical officers (30x36=1,080) in the intervention and control group, before and after.

Post intervention survey among medical officers

We did not sample the medical officers and offered participation to the 135 medical officers working in rural health care facilities.

Data collection

Prescription surveys

22 health workers conducted the prescription surveys. We trained them for two days. We pilot tested the data collection instruments in health care facilities not included in the study. The principal investigator verified 15% prescriptions in both the control and intervention groups.

Post intervention survey of medical officers

22 health workers interviewed medical officers using a close-ended, standardized questionnaire to collect information about knowledge, attitudes and practices with respect to the use of injections to administer medications and infection control practices when giving injections.

Analysis plan

We entered and cleaned the data in Epi Info software. We calculated the crude frequency of all variables. We computed the proportion of patients receiving at least one injection for the control and the intervention groups at

the pre and post intervention stages. We calculated the change in the proportion of prescriptions including one injection in both intervention and control group. We calculated absolute effect size as the gain in the intervention group i.e. the difference between the percent improvement in the intervention group and the percent improvement in the comparison group [(%after-%before) intervention - (%after-%before)control].[24] To analyze the post intervention survey among all medical officers, we compared medical officers who had participated in the interactional group discussion with those who had not (either because they were in the control group or because they had not participated in the trial) with respect to their frequency of the various knowledge, attitudes and practices.

Human subject protection

We informed medical officers about their rights and about the voluntary nature of their participation. We informed the community members that they were free to withdraw at any time from the session without any reason. We collected written informed consent from study participants. We ensured confidentiality by using codes. Medical officers benefited by the study as they received evidence-based information regarding injection use, injection safety and transmission of bloodborne pathogens. After the interactional group discussions, we distributed the injection safety awareness materials prepared as per WHO guidelines in English for medical officers and in Bengali for community members. The ethical committee of the National Institute of Epidemiology (Indian Council of Medical Research, ICMR) cleared the protocol.

Interactional group discussions and their impact on injection use

Pre intervention prescription survey

Before the intervention, 249 of 1,080 prescriptions (23%) contained at least one injection in the intervention group, compared with 231 of 1080 prescriptions (21%) in the control group (Relative risk: 1.1, 95% confidence interval [CI] 0.92-1.3) (Table 1). The ratio of injections per 100 prescriptions was 37% in intervention group versus 33% in control group.

Interactional group discussion intervention

We conducted seven interactional group discussions to include the 36 medical officers of the intervention arm. Thirty six community members took part in the discussions along with the prescribers. During the sessions, most doctors reported that they prescribed as per their choice and that they were not influenced by the patients. They expressed concern after receiving information regarding overuse and unsafe injections in West Bengal. Medical officers asked several questions regarding injection equipments reuse, hepatitis viruses transmission and preventive measures that can be taken. They actively and positively participated in the interaction with the community members. Most of the community members expressed that they did not prefer injections and that they relied on doctors regarding the choice of route to administer medications.

Post intervention prescription survey

In the intervention group, 79 of 1,080 prescriptions (7%) included at least one injection versus 178 of 1,080 prescriptions (16%) in the control group (RR: 0.44, 95% CI: 0.35-0.57, Table 1). The ratio of injections per 100 prescriptions decreased from 37% and 33% in the intervention and control groups, respectively, during the pre intervention survey to 11 and 21% after the intervention, respectively. The proportion of prescriptions including at least one injection decreased in both the intervention (RR: 0.32, 95% CI: 0.25-0.40) and the control group (RR: 0.77, 95% CI: 0.65-0.92). However, in the control group, the reduction was larger among the 15 medical officers who shared their assignment location with a medical officer of the intervention group than among the 21 others (RR: 0.47, 95% CI: 0.36-0.63 versus RR: 1.1, 95% CI: 0.86-1.4, respectively).

Post-intervention survey among medical officers

Of the 135 medical officers working in the rural areas of the district, 98 (73%) accepted to participate in the post intervention survey. The proportion of response was highest among the 36 officers included in the trial and exposed to the intervention (n=36, 100%), intermediate among the 36 who were included in the trial but assigned to the control group (n=25, 69%) and lowest among the 63 who had not been sampled for the trial (n=37, 59%). Compared with those who were in the control group or who did not participate in the trial, medical officers who took part in the interactional group discussions knew more about the risks of transmission of bloodborne pathogens through unsafe injections and about the misconceptions that doctors may have about preference for injections among patients (Table 2).

Medical officers exposed and unexposed to the intervention did not differ for most of the reported criteria used to choose injections over other forms of administration

(Table 3). However, those who had participated in the intervention quoted less frequently that injections were strong medications (Table 3). Finally, those exposed to the intervention reported better infection control practices while giving injections (Table 4).

Discussion

Before the intervention, a high proportion of prescriptions included injections in both the intervention and the control group. Following the interactional group discussions, the level of knowledge about injection use, injection safety and the misconceptions associated with the choice of injections to give medications was higher among medical officers who took part in the intervention than among others. The proportion of prescriptions including one injection reduced significantly in both the intervention and control groups in the post intervention survey. However, the decrease was more marked in the intervention group. Furthermore, in the control group, the reduction was mostly observed among medical officers who shared their health care facility with a medical officer from the intervention group. These findings have important implication for the reduction of injection overuse in West Bengal.

Several studies reported overuse and unsafe use of injections in India.[16-23] The interactional group discussion intervention led to higher level of knowledge about the risk of bloodborne pathogens transmission through injections and improved the self-reported safety of injection practices. It also

improved selected elements, including the knowledge that injection frequency is high in India, the misconception that patient prefers injections and the perception of injections as strong medications. Possible explanations for these improvements include the dissemination of scientific knowledge about overuse and reuse of injections provided during the intervention. However, the attitudes about most reported reasons to choose injections over other forms of administration did not differ among doctors exposed and unexposed to the intervention. This underlined the limitations of the effectiveness of information transfer alone to change attitudes and perceptions among physicians for fundamental notions such as the choice of a route of administration for a medication.

One fifth of the prescriptions included at least one injection in both the intervention and control groups in the pre intervention survey. This proportion was reduced significantly in the intervention group after the intervention. Moreover, there was a reduction in total number of injections in the intervention group. This suggested that the intervention had been effective in reducing injection overuse. Since the information transfer was unsuccessful in changing most perceptions and attitudes about the choice of injection to administer medications, it may be the interactions with community members that were effective at clarifying the misconceptions among prescribers regarding the preference for injections among patients. The effectiveness of our intervention is consistent with the results of similar intervention studies based on interactional group discussions conducted in Indonesia,[13] Pakistan[14] and Cambodia.[15] In 1992, a controlled trial in 24 public health centers of one district of Indonesia led to significant decrease in injection use in the intervention group compared to the control group. In that study, there was

also a decrease in injection frequency in the control group, probably as a result of a contamination of the intervention to the control group. [13] In Pakistan, in 2003, following reports of unsafe and overuse of injections in the country, [25-27] an intervention in the informal private sector led to a significant reduction of injection use in the intervention group in the absence of any change in control group.[14] In 2004, in Cambodia, where injections were overused, [28] a study reported a reduction in injection overuse in the intervention group while there was no change in the control group.[15]

While our interventions was effective as in these three countries, in our study the absolute effect size in the intervention group versus the control group was lower (– 11%) than in Indonesia (– 19%), Pakistan (– 32%) and Cambodia (– 20% and – 23%). A reduction in the proportion of prescriptions including at least one injection in the control group in our study may partly explain this smaller effect size. In the control group of our study, the reduction of injection use mostly occurred among those who shared the health care facility with a medical officer of the intervention group. This support the hypothesis of a contamination of the intervention, as was the case in the Indonesia study. This contamination is a limitation of our study from a methodological standpoint. However, from a public health stand point, it suggests that communication of the results of the interactional group discussion can be beneficial even though the prescriber did not participate the discussion.

This study had three limitations. First, we could not compare the knowledge, attitudes and practices among medical officers before and after the intervention. We only surveyed these once after the intervention. We did not conduct such a survey before the intervention to avoid spreading the

knowledge in the district, as this could have altered the result of the intervention. As a consequence, we are limited in our capacity to assess the effect of our intervention on knowledge and attitudes. Second, the post intervention survey was conducted only once. Unlike the Indonesian study, we were unable to conduct those at regular intervals for a prolonged period to assess the sustainability of the intervention. As a result, we cannot conclude about the sustainability of the effect that we measured. Third, our post intervention survey of the self-reported infection control practices while giving injections was not validated by observations. Thus, we cannot exclude that the difference among the groups exposed and unexposed to the intervention is in fact a consequence of a desire to satisfy the interviewer. However, even if that was the case, the differences in the two groups suggest that the intervention was at least successful in communicating the acceptable standards to the target audience.

This study supports the finding of three comparable trials in other countries and suggests that interactional group discussion was also effective as an intervention to reduce injection overuse in the rural public health care facilities of the "North 24 Parganas" district of the state of West Bengal in India. Even though it did not change some of the main determinants to give an injection, this intervention clarified prescribers' misconceptions about patient's preference for injections and improved knowledge about bloodborne pathogen transmission through unsafe injections. Furthermore, our study also suggested that the person-to-person dissemination of the outcome of the discussion between medical officers could be effective by itself in reducing prescription habits.

On the basis of these conclusions, we recommended (1) scaling up the intervention to organize interactional group discussion sessions for more medical officers working in rural health care facilities of West Bengal, (2) communicating the results of the intervention through various meetings, including district monthly meeting and other medical association settings, (3) publication of the results in the press that targets medical officers, (4) future monitoring and evaluation to confirm the sustained reduction of injection frequency after scaling up of the intervention. Such a scaling up should reduce the spread of bloodborne pathogens in West Bengal and in the country if other Indian states wish to join in such interventions.

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Table 1: Proportion of prescriptions including at least one injection before and after the interactional group discussion intervention, rural medical officers, North 24 Parganas district, West Bengal, India, 2007

Stage of the study	Proportion of prescriptions including at least one injection					
	Intervention group (N=1080)		Control group (N=1080)		Relative risk	
	#	%	#	%	Estimate	95% CI[1]
Pre intervention survey	249	23	231	21	1.1	0.92-1.3
Post intervention survey	79	7	178	16	0.44	0.35-0.57

[1] Confidence interval

Table 2. Prevalence of knowledge regarding injection use among medical officers working at rural public health care facilities (n=98), North 24 Parganas district, West Bengal, India, 2007

		Prevalence of knowledge				Prevalence ratio	
		Intervention group (n=36)		Medical officers not exposed to the intervention (n=62)			
Knowledge		#	%	#	%	Estimate	95% CI
General	Hepatitis B prevalence in India	29	81	28	45	1.8	1.3-2.5
	Personal serological status of hepatitis B	10	28	24	39	0.72	0.39-1.3
Injection use	Injection frequency in India compared to developed countries	32	89	26	42	2.1	1.6-2.9
	Injection use in India compared to actual needs	24	67	42	68	0.98	0.74-1.3
	Patient's preference to injections for treating common diseases	30	83	17	27	2.8	1.8-4.4
Injection safety	Hepatitis B transmission through injections in India	34	94	33	53	1.8	1.4-2.3
	Risk hepatitis B virus infection after needle stick injury	30	83	21	34	0.99	0.79-1.2
	Risk of hepatitis C virus infection after needle stick injury	31	86	9	15	5.9	3.2-11
	Risk of HIV infection after needle stick injury	33	92	32	52	1.8	1.4-2.3
	Inactivation of HBV in the environment	26	72	19	31	2.4	1.5-3.6
	Safest place to administer injection	21	58	14	23	2.6	1.5-4.4
Practices at risk for pathogen transmission	Re use of disposable syringes and needles on different patients	28	78	13	21	3.7	2.2-6.2
	Re use of disposable syringes on different patients	29	81	22	36	2.3	1.6-3.3
	Re use of disposable syringes on the same patient	27	75	42	68	1.1	0.86-1.4
	Use of multi dose vials	28	78	54	87	0.89	0.73-1.1

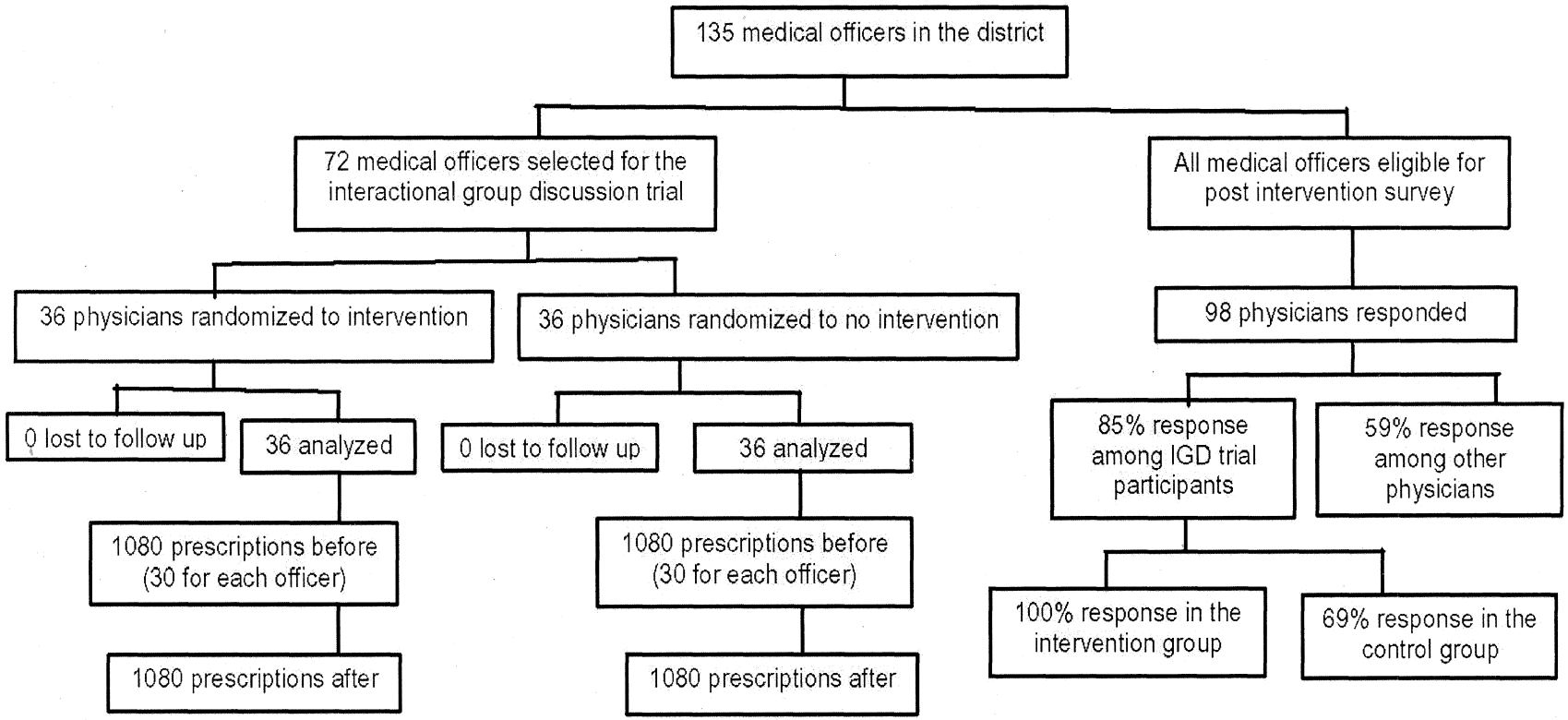
Table 3 Criteria used to choose injections to administer treatment among medical officers (n=98) working at rural public health care facilities, North 24 Parganas district, West Bengal, India, 2007

Attitudes	Prevalence of attitude				Prevalence ratio	
	Intervention group (n=36)		Medical officers not exposed to the intervention (n=62)			
	#	%	#	%	Estimate	95% CI
Recommendations from Ministry of Health	25	69	41	66	1.1	0.79-1.4
Intestinal absorption of the drug	34	94	53	86	1.1	0.97-1.3
Inability to take medications by mouth	33	92	57	92	1.0	0.88-1.1
Desire of a quick action	19	53	45	73	0.73	0.52-1.0
Desire of a strong effect	22	61	58	94	0.65	0.50-0.85
Desire to respond to patient's expectations	20	56	43	69	0.80	0.57-1.1
Underlying chronic condition in the patient	29	81	54	87	0.92	0.77-1.1
Desire to avoid abdominal side effects of drugs	28	78	43	69	1.1	0.88-1.4

Table 4: Reported infection control practices among medical officers (n=98) working at rural public health care facilities, North 24 Parganas district, West Bengal, India, 2007

	Frequency of the reported practice				Prevalence ratio	
	Intervention group (n=36)		Medical officers not exposed to the intervention (n=62)			
Practices	#	%	#	%	Estimate	95% CI
Skin disinfection with a single use swab	32	89	45	73	1.2	1.0-1.5
Use of a new disposable syringe	25	69	28	45	1.5	1.1-2.2
Use of a new disposable needle	26	72	28	45	1.6	1.1-2.3
Use of single dose injection	33	92	40	65	1.4	1.2-1.8
Disposal of sharps in a plastic sharp container	27	75	28	45	1.7	1.2-2.3
Use of gloves to administer injections	28	78	32	52	1.5	1.1-2.0
Preparation of injection in a area not contaminated with blood	23	64	29	47	1.4	0.95-1.9
Hand washing before injection	26	72	33	53	1.4	1.0-1.9

Figure 1. Diagram presenting the flow of participants through the randomized trial and the survey of physicians conducted after the trial



Appendix A: CONSENT FORM

1: **Consent form for the medical officers working at public rural health care facilities participating in the interactional Group Discussion to reduce overuse and unsafe injections, North 24 Parganas district, West Bengal, India, 2007**

Greetings,

I am, Dr Rama Bhunia, principal investigator of the study and MAE-FETP Scholar (VIth cohort) of National Institute of Epidemiology, Chennai, working with the district health administration, North 24 Parganas. We are conducting this study to reduce overuse and unsafe injections that may put community members at risk for blood borne pathogens. Factors leading to injection overuse are prescriber and patient misunderstandings. As prescriber overestimate about the expectations of patients that patient prefers injections. The National Institute of Epidemiology, Chennai is also working with us.

The interactional group discussion, an intervention strategy is indicated to be effective in other countries for reducing injection overuse. Thus between _____ and _____, we will be conducting interactional group discussion in selected areas of the district. We would conduct the intervention keeping confidentiality of all the participants. The session will take 120 minutes. Taking part in this study is voluntary. No compensation will be paid to you for taking part in this study. You have every right not to join the study. The benefit of taking part in the survey is that we will inform you about injection safety and blood borne diseases e.g. viral hepatitis B, C. However, taking part in the study may benefit the community and will help us in identifying an effective strategy of intervention to reduce injection overuse.

We shall use code-numbers instead of names to maintain confidentiality. The key of code will be with principal investigator and will be kept under lock and key. It will be destroyed after completion of the project. If you wish to find out more about the study before taking part, you can ask me all the questions you want or can contact me later at office of the chief medical officer of health, Barasat, North 24 Parganas district or by telephone 9433126750.

I have read the foregoing information. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this study and I understand I have the right to withdraw at any time without any consequence.

Name of the medical officer Signature of the medical officer

Name of the witness Signature of the witness

Name of the facilitator Signature of the facilitator

2: **Consent form for the community members participating in the interactional Group Discussion to reduce overuse and unsafe injections, North 24 Parganas district, West Bengal, India, 2007**

Greetings,

I am, Dr Rama Bhunia, principal investigator of the study and MAE-FETP (VIth cohort) Scholar of National Institute of Epidemiology, Chennai. I am working with the district health administration, North 24 Parganas. We are conducting this study to reduce injection overuse that may put you or community members at risk for blood borne pathogens. Factors leading to injection overuse are prescriber and patient misunderstandings. As prescriber overestimate about the expectations of patients that patient prefers injections. The National Institute of Epidemiology, Chennai is also working with us.

The interactional group discussion, an intervention strategy is indicated to be effective in other countries for reducing injection overuse. Thus between _____ and _____, we will be conducting interactional group discussion in selected areas of the district. We would conduct the intervention keeping confidentiality of the participants. The session will take 120 minutes. Taking part in this study is voluntary. No compensation will be paid to you for taking part in this study. You have every right not to join the study. The benefit of taking part in the survey is that we will inform you about blood borne diseases e.g. viral hepatitis B, C and injection safety. It will help us in identifying an effective strategy of intervention to reduce injection overuse.

We shall use code-numbers instead of names to maintain confidentiality. The key of code will be with principal investigator .It will be kept under lock and key and will be destroyed after completion of the project.

If you wish to find out more about the study before taking part, you can ask me all the questions you want or can contact me later at office of the chief medical officer of health, Barasat, North 24 Parganas district or by telephone 9433126750.

I have read the foregoing information or it has been read to me. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this study and I understand I have the right to withdraw at any time without any consequence.

Name of the patient/community member

Signature of the patient/community member

Name of the witness

Signature of the witness

Name of the facilitator

Signature of the facilitator

3: **Consent form for evaluating knowledge, attitude and practices of medical officers working at government rural health care facilities regarding injection safety, North 24 Parganas district, West Bengal, India, 2007**

Greetings,

I am----------working with the district health administration, North 24 Parganas district. We are conducting a research survey regarding injection safety. To do this survey, we are asking a series of questions about medical officer's knowledge, attitude and practices with respect to injection use and injection safety. You have been chosen to take part in this survey, which will take only 10 to 15 minutes to complete .There is no risk to taking part in this survey, although you might feel you do not want to answer some of the questions. Taking part is your choice; you can choose not to answer any of the questions or stop at any time. The benefit of taking part in the survey is that we will inform you about blood borne diseases e.g. viral hepatitis B, C and injection safety. Your name will not be recorded on the forms where you will write your answers. Instead we will use a special code number. The answers will be kept confidential to the extent that is legally possible. If you have any questions about the survey, you may ask them now or you can call Dr Rama Bhunia, principal investigator of the study and MAE-FETP (VIth cohort) Scholar of National Institute of Epidemiology, at 9433126750 or District Tuberculosis Officer, North 24 Parganas district. The National Institute of Epidemiology, Chennai is also working with us.

I have read the foregoing information. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this study and I understand I have the right to withdraw at any time without any consequence.

Name of the medical officer Signature of the medical officer

Name of the witness Signature of the witness

Appendix B: Data collection instrument
Intervention group

1: Pre-Intervention prescription Survey

Pre- intervention code : 1, Doctor code: 01-36, Prescription no-01-30

ID	Injection (Y/N)	No of injections
10101		
10102		
10103		
10104		
10105		
10106		
10107		
10108		
10109		
10110		
10111		
10112		
10113		
10114		
10115		
10116		
10117		
10118		
10119		
10120		
10121		
10122		
10123		
10124		
10125		
10126		
10127		
10128		
10129		
10130		

Control group
Pre intervention: 1, Doctor: 37-72, Prescription No: 31-60

ID	Injection (Y/N)	No of injections
13731		
13732		
13733		
13734		
13735		
13736		
13737		
13738		
13739		
13740		
13741		
13742		
13743		
13744		
13745		
13746		
13747		
13748		
13749		
13750		
13751		
13752		
13753		
13754		
13755		
13756		
13757		
13758		
13759		
13760		

Appendix B: Data collection instrument (continued)
Intervention group

2: Post-Intervention prescription Survey

Post intervention: 2, Doctor: 01-36, Prescription No-01-30

ID	Injection (Y/N)	No of injections
20101		
20102		
20103		
20104		
20105		
20106		
20107		
20108		
20109		
20110		
20111		
20112		
20113		
20114		
20115		
20116		
20117		
20118		
20119		
20120		
20121		
20122		
20123		
20124		
20125		
20126		
20127		
20128		
20129		
20130		

Control group

Post intervention: 2, Doctor: 37-72, Prescription No: 31-60

ID	Injection (Y/N)	No of injections
23731		
23732		
23733		
23734		
23735		
23736		
23737		
23738		
23739		
23740		
23741		
23742		
23743		
23744		
23745		
23746		
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23749		
23750		
23751		
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23754		
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23757		
23758		
23759		
23760		

3. **Questionnaire**: knowledge attitude and practice survey of medical officers working at public rural health care facilities, North 24 Parganas district, West Bengal, India, 2007

General information					
1. What is your age in years?	1) Under 35 years	2) 35-44 years	3) 45-59 years	4) 60 years or more	
2. What is your sex?	1Male	2Female			
Hepatitis B					
3. By your knowledge, what is the percentage of the population of India chronically infected with Hepatitis B virus (HBsAg-positive)	1) Less than 2%	2) 2-7%	3) 8-9%	4) 10% or more	5) Don't know
4. Do you know, what is your personal serological status with respect to HBV infection?	1) Yes	2) No			
5. How many doses of hepatitis B vaccine have you ever received?	1) Number of doses 0/1/2/3/4	2) Don't know			
Injection use in India					
6. How does the frequency of injections in India compared with the frequency in industrialized or developed countries?	1)More injections in developed countries	2)Equivalent	3)More injections in India	4)Don't know	
7) How do you realize the frequency of injection use in India compared with actual needs?	1) used too often	2) adequately	3) used rarely	4)Don't know	
8) Do patients generally prefer injections to pills for the treatment of common medical conditions(fever, diarrhea, common cold)	1) Yes	2) No	3) Don't know		
Criteria for choosing injections as treatment in your opinion:					
9.1) Recommendations from university professors?	1) Often influential	2) Never influential			
9.2) Recommendations from the Ministry of Health?	1) Often influential	2) Never influential			
9.3) Intestinal absorption of the drug?	1) Often influential	2) Never influential			
9.4) Inability to take medications by mouth?	1) Often influential	2) Never influential			
9.5) desire of a quick action?	1) Often influential	2) Never influential			
9.6) Desire of a strong effect?	1) Often influential	2) Never influential			
9.7) Desire to respond to patient's expectations?	1) Often influential	2) Never influential			
9.8) Underlying chronic condition in the patient?	1) Often influential	2) Never influential			
9.9) Desire to avoid abdominal side effects of drugs?	1) Often influential	2) Never influential			
Injection safety					
10) In your opinion, is hepatitis B/C transmitted through injections in India today?	1) Yes	2) No			
11) In your opinion, what is the probability that a susceptible health care worker would acquire hepatitis B virus infection following a needle stick from an infected source -patient?	1) Less than 1%	2) 1-9%	3) 10-69%	4) 70% or more	5) Don't know
12) In your opinion, what is the probability that a susceptible health care worker would acquire hepatitis C virus infection following a needle stick from an infected source -patient?	1) Less than 1%	2) 1-9%	3) 10-69%	4) 70% or more	5) Don't know
13) In your opinion, what is the probability that a susceptible health care worker would acquire HIV infections following a needle stick from an infected source –patient?	1) Less than 1%	2) 1-9%	3) 10-69%	4) 70% or more	5) Don't know
14) Blood borne virus transmission:					

14.1) Re-use of disposable syringes and needles on a different patient?	0)Non existent	1) Low	2) Moderate		3) High
14.2) Re use of disposable syringes alone on a different patient?	0)Non existent	1) Low	2) Moderate		3) High
14.3) Re –use of disposable syringes alone on the same patient?	0)Non existent	1) Low	2) Moderate		3) High
14.4) Use of multi-dose vials?	0)Non existent	1) Low	2) Moderate		3) High
14.5) In your opinion, how much time does hepatitis B virus remains infective on environment surfaces?	1) Up to a minute	2) Up to ten minutes	3)) Up to a day	4) Up to a week	5) Don't know

15) Solutions to inactivate hepatitis B virus on environment surfaces?			
15.1) Detergent?	1) Yes	2) No	3) Don't know
15.2) Sanitary alcohol?	1) Yes	2) No	3) Don't know
15.3) Alcohol-Iodine solution?	1) Yes	2) No	3) Don't know
15.4) Bleach solution?	1) Yes	2) No	3) Don't know

16) Of these three settings, which is the one that you consider the safest to administer an injection?	1) Home	2) Dispensary	3) Hospital	4) Don't Know

17) Infection control practices for the prevention of the transmission of blood borne virus through injections?		
17.1) Skin disinfection with single use swab	1) Not important	2) Important
17.2) Use of a new disposable syringe	1) Not important	2) Important
17.3)Use of a new disposable needle	1) Not important	2) Important
17.4) Use of single –dose medication and diluents vials?	1) Not important	2) Important
17.5) Disposal of sharps in a plastic sharp container	1) Not important	2) Important
17.6) Use of gloves to administer medications	1) Not important	2) Important
17.7) Preparation of the injection in a area, separate from areas that may be contaminated with blood	1) Not important	2) Important
17.8) Hand washing before injections	1) Not important	2) Important

2.3: Materials used for interactional group discussion

1."The Good Prescriber's Guide"

Did you know that over 300-600 crore injections are administered in our country each year?

- Recent research shows that on average each person receives between 2.9 (three months recall) and 5.8 injections (two weeks recall) each year. This use of injectables is higher than in many other countries in the world.

Of course a safe injection does no harm. However not every injection in our country is given safely. Unsafe injections expose patients, providers and the community to harm.

Unsafe injection practices – a dangerous engine of disease

Unsafe injection practices are known to transmit BBV including hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV. In the world, unsafe health care injections may explain 32% of HBV infections, 40% of HCV infections and 5% of HIV infections.

Hepatitis B Virus (HBV)

The prevalence of hepatitis B surface antigen positive carrier rate in our country is 3-5%. It is particularly infectious in the healthcare setting. This is because:

- Infected patients usually have a very high concentration of virus in their blood.

- The transmission potential of HBV through unsafe injections is ten times higher than for HCV and a hundred times higher than for HIV.

- HBV persists in the environment in healthcare settings for at least a week.

HBV can also be transmitted through unsafe use of multi-dose vials and preparing injections in environments contaminated with blood and body fluids. Event the reuse of injection equipment on the same patient is dangerous as it can lead to contamination of multi-dose vials.

Hepatitis C Virus (HCV)

Our country has a high prevalence of hepatitis C (1 to 2%). HCV infection is a major cause of cirrhosis and hepatocellular carcinoma, which are often fatal conditions. Unsafe injections are a major cause of HCV infection in our country.

HIV

According to WHO, approximately 2.5 million persons with 2 to 4% prevalence are already infected with the HIV in our country. Although sexual transmission accounts for the majority of new cases, it is known that reuse of syringes and needles can also transmit the virus.

Unsafe injection practices – a real problem

After you prescribe an injection, can you guarantee that the patient is administered a safe injection?

- Unsafe injection practices are much more common than you might think. In addition, during a recent survey at health care facilities, 68.7% of injections were unsafe. Not everyone who provides the injection you prescribe is trained. By prescribing an injectable you may be exposing your patient to risk.

- **Rational prescribing**

Public and private doctors prescribe the majority of injections. Self-medication by injections does not account for a high proportion of the injections given in our country. Therefore, you can help in reducing the unnecessary use of injections. The results of a recent research show that 40.7% clients exiting government health facilities had received injections during their visit. This proportion is too high and should be decreased. 51.1% exit interview of curative injections at all India level were prescribed for fever, cough and diarrhoea. The most commonly prescribed medications include antibiotics, analgesics, antispasmodics, vitamins and corticosteroids. All these medications are just as effective when given by mouth .Injections should only be used for life threatening conditions, malabsorption syndromes or inability to swallow. According to expert opinion as many as 70% of all injections prescribed could be avoided by offering equivalent oral preparations. These are much, much safer for your patient. If in doubt, refer to the national standard treatment guidelines: You will see that they recommend injections for only a minority of conditions.

Box: Are oral medications just as strong and effective?

- Yes. Intramuscular administration does not improve or accelerate the availability of the active component in the body. In fact in some cases, the availability is actually slower or more irregular than oral administration. Intramuscular injections are solely indicated, when a patient cannot swallow, when they vomit or cannot absorb medications in their intestine.

- Intravenous infusions do lead to a faster availability of the drug in the body. However, their use should be limited to the emergency treatment of severe, life threatening conditions.

What should I do if my patients prefer or request injections?

Patient preference is the most common reason given by doctors for prescribing injections. The majority of respondents explained that they trusted the doctor's choice. 44.1% accept the doctor's decision to administer injections even when these were perceived to be for unnecessary reasons .Your patient will not change his doctor just to get an injection: Your patient places his trust in you. Experience shows that doctors who take the time to understand their patients' desires soon realize that clients are open to the use of oral medications. Similarly, in contrast to what physicians often imagine, patients will not change their doctor just to get an injection.

We need your help! Whenever possible, do suggest an oral medication and take a little time to explain to your patient. You may be surprised how successful this can be.

Interactional group discussion to reduce overuse of injections in developing countries: a review

Introduction

Injections are one of the most common skin piercing health care procedures worldwide.[i, ii] Poor injection practices are common in many parts of the world.[1, iii] Injections are prescribed for the treatment of conditions that could be treated with oral drugs or for which medications are not indicated.[3] Therapeutic injections were misused for many common medical purposes including diarrhea, fever, cold, weakness and pain. [iv,v] Of these 40% to 70% of injections are given with syringes and needles reused without sterilization and of which more than 70% of injections are unnecessary.[vi] However, a safe injection does not harm the recipient, does not expose the provider to any risks and does not result in any waste that is dangerous for the people.[6] Injection overuse and unsafe injection practices result in transmission of bloodborne pathogens.[vii,viii,ix,x,xi] Several studies have indicated that unsafe injections transmit hepatitis B virus,[7,xii] hepatitis C virus,[9,xiii,xiv] human immunodeficiency virus[xv,xvi], abscesses,[xvii] septicemia,[xviii] malaria [xix]and other viral hemorrhagic fever viruses.[xx] In industrialized countries, several studies indicated that unsafe injections led to bloodborne disease transmission in early twentieth century.[xxi] After introduction of one sterile syringe and needle for each patient, high awareness, sufficient supplies and safe waste disposal and later disposable syringes reduced the injection associated bloodborne pathogen transmission to needle-stick injuries among health workers and among injecting drug users through syringes and needle sharing with a residual risk for the general population through medical and dental procedures

in industrialized countries.[21] In contrast, in developing countries, the introduction of disposable injection equipment without adequate training, supplies or waste disposal has led to the reuse of such devices without sterilization.[21] In 2000, World Health Organization estimated that in transitional and developing countries, 16 billion injections were given, for a ratio of 3.4 injections per person and per year. [3,6,xxii] Of these, 95% were therapeutic injections and 39% were unsafe.[3,6,xxiii] In 2000, WHO estimated that 40% new hepatitis C virus infections, 30% new hepatitis B virus infection and 5% of new HIV infections were attributable to unsafe health care injections in developing and transitional countries.[22, 23] Overuse and unsafe injection practices were common.[xxiv, xxv, xxvi] However, in developing countries, blood borne disease transmission through unsafe injections persisted among general population.[8,9,10,11,12] Reuse of injection equipments in the absence of sterilization is common, particularly in health care facilities that serve low income populations.[xxvii] Introduction of disposable syringes eliminated the problem of unsafe injections in developed countries but it did not lead to safe injection practices in developing countries with no infrastructure for safe disposal of sharps.[21] These infections led to a burden of chronic liver diseases and AIDS, causing an estimated 283,000 early future deaths between the years 2000 and 2030 for a total of 9,177,679 discounted and age-weighted DALYs respectively.[xxviii]

In India, many therapeutic injections are unnecessary and unsafe.[xxix,xxx,xxxi,xxxii,xxxiii,xxxiv,xxxv,xxxvi] In 2003, the Indian Clinical Epidemiology Network (India CLEN) assessed injection practices in collaboration with the Ministry of Health and Family Welfare and the World Bank.[xxxvii] They conducted a cluster survey among prescribers, injection providers, patients

and general population in both private and government health sector dividing India into 15 zones. In rural areas, the annual ratio of injections received per person and per year were 6.1 and 3 when two weeks' and three month's recall periods were used respectively. 83% of injections were given for therapeutic purposes and 51% injections were given for fever, cough and diarrhea as per exit interview. Of these 42% of patients exiting rural government health facilities had received injections. While 74% of patients reported preferring injections, 44% of also reported accepting doctors' decisions, even when patients perceived that injections were unnecessary. In addition to being overused, injections were also unsafe in 69% of government health care facilities. IndiaCLEN study recommended communication behavior change among health professionals and the community along with other measures.[37]

In the "zone four" of the India CLEN study that included the state of West Bengal, the number of injections per person and per year was 2.1 and 1.7, for the two week and three month recall period, respectively. In government health sector, 33% prescriptions included at least one injection as per exit interviews, 92% injections observed were unsafe and 68% unsafe injections carrying a potential risk of transmission of bloodborne virus, respectively. Overall, the IndiaCLEN study recommended communication for behaviour change among health care professionals and the community to reduce injection overuse, along with other interventions to improve safety.[37] The objective of this literature review is to locate the most suitable intervention measure to reduce injection overuse in North 24 Parganas district of West Bengal, India in 2007.

Methods

We conducted a systematic search of literature published in internet and journals. We searched for the causes of injection overuse in developing countries and measures to be taken to reduce injection overuse. We summarized observations on intervention measures. The definitions described below were assumed for the purpose of the study.

An injection is a skin piercing event performed with a syringe and needle with the purpose of introducing a curative substance or a vaccine into a patient by the intramuscular, intravenous or subcutaneous route.

Unnecessary injection is defined as an injection given where oral alternatives are available, where the injected substance is inappropriate or harmful, or where the symptoms or diagnosis do not warrant treatment by injection.

Injection overuse is defined as an increase in number of injections given for unnecessary reasons.

Interactional group discussion is an intervention where patients and prescribers exchange views on injections with the assistance of a facilitator who can clarify the misunderstandings and effective in reducing injection overuse.

Injection overuse: explanation

Injection overuse was a public health problem in developing countries for various reasons. In Korea, physicians had faulty knowledge and beliefs on strong patient demand for injections that led to higher injection prescription rates.[xxxviii] In Pakistan, people's lack of awareness of risks associated with injections and their strong belief in quick action and general practitioner's inclination towards prescription of injection were driving injection overuse.[xxxix] Injection overuses were common with variety of causes including poor knowledge about the risk of bloodborne virus transmission, belief of a better efficacy, stronger medications, work faster and sometimes financial incentives[26,40,41,42,43]. In India, overuse of injection was documented in several studies for several reasons such as low awareness about the risk of bloodborne virus transmission and prescribers misunderstanding about patients preference .[35, 37] Proportion of outpatients who receive an injection for a healthcare visit was developed as an indicator for injection use in healthcare setting by the Drug Action Programme and review of information collected using this indicator suggests that in many countries between 25% and 96% of persons presenting to a health care provider receive an injection.[43] Most prescribers have misperception that patients prefer injections.[44] Although 5-20% population prefers injections, prescribers often overestimate this preference. This minority of population apply pressure on providers by making strong demands for injections. This leads providers to believe that all patients prefer injections. Thus, providers prescribe more injections, including to the 80-95% who do not prefer injections. As a result, all patients consider that it is the providers who prefer injections. Most of the patients are in fact open to

alternative of injected medications if the risks and benefits involved are properly explained to them. Misunderstanding between patients and providers leads to injection overuse.[44] This belief leads to more injection use exposing more people to unsafe needles and syringes. Since more injections are given; more people are exposed to needles and syringes. Moreover, if the use of injections exceeds the availability of injection equipment re-use of syringes and needles is likely to occur. Syringes are re used for a variety of reasons due to a lack of awareness regarding the risk of bloodborne pathogen transmission, a lack of supplies, a cultural resistance to waste in countries where resources are scarce for incineration or disposal and absence of infrastructure for the safe collection and destruction of used injection equipment. [35,40,41,42,43,44]

Intervention measures to reduce injection overuse

As a response to the emerging unsafe and overuse of injection practices accounting large scale bloodborne transmission worldwide, stakeholders joined their forces in a Safe Injection Global Network (SIGN) in 1999, an international alliance to attain the safe and appropriate use of injections world-wide.[43] The WHO strategy to achieve safe and appropriate use of injections has three key elements.[6,44]

i. Changing the behaviour of patients and health care providers to avoid injection overuse and achieve safe practices through information education and communication materials
ii. Providing enough injections equipment to ensure injection device security
iii. Developing appropriate healthcare waste management systems

In 1992, an intervention study conducted in Indonesia, in collaboration with the International Network for the Rational Use of Drugs (INRUD) suggested that when physicians are confronted with the actual absence of preference for injections among patients, they can alter their prescription practices and reduce injection overuse.[45] That formative study indicated that patients attribute injection overuse to the will of prescribers while prescribers attribute it to patient's demand. This discrepancy was named cognitive dissonance. Hypothesized mechanisms for behaviour change include the reality testing of prescribers' assumptions about patients' beliefs, the provision of scientific information about injection efficacy and the establishment of peer norms about correct behaviour. In interactional group discussion, prescribers and patients exchange views on injections with the assistance of a facilitator. Interactional group discussion can clarify these misunderstandings. On the basis of the experience from Indonesia, the World Health Organization designed an intervention guide that could be applied to different countries facing injection overuse.[44] Prescribers constitute the main target of interactional group discussions. The objective of the presence of community members is to confront prescribers with the real attitudes towards injections that are prevalent in the population. The number of sessions should be sufficient so that every prescriber in the community or district has participated in at least one session. To organize a session, personnel needed are one facilitator or district level public health specialist with good inter personal skills, a resource person or pharmacologist who can state oral medicines are equivalent to injections in most cases, six prescribers, six members of the general population including mothers of young children. The members of the general population attending the session should find it easy, comfortable, having no fears and culturally acceptable. A place where people feel

comfortable is a good choice for venue with duration 120 minutes. The sessions consist of introduction for 15 minutes, discussion for 90 minutes and consensus statement 15 minutes. After introducing the participants, the facilitator introduces the topic of injection overuse in the community, the misconception regarding patient's preferring injections and impact of injection overuse on costs. The resource person makes a short authoritative statement to the effect that oral medicines are effective and act quickly as injected medicines in most cases. The facilitator introduces the possibility of a discrepancy between the perception of prescribers who believe that patients prefer injections and real attitudes in the population. During discussion, the facilitator initiates the discussion by addressing the mothers and then the prescribers. At the end, the facilitator invites participants to formulate a consensus statement including take home messages such as injections are overused in the community, may be unsafe, oral drugs can be used, prescribers will explain the risks of injections and promote oral medications and community members will disseminate the information about the risks of injections to the community. The main take home message from the interactional group discussion is that patients can be open to alternatives to injections.[44] Number of reports indicated that selected behaviour change strategies, including "interactional group discussions" between patients and prescribers may be effective at decreasing injection overuse.[45,46,47] As a result, interactional group discussion interventions were conducted in Karachi, Pakistan among general practitioners in the informal private sector,[46] in referral hospitals in Cambodia [47]and in primary health care facilities in Tanzania.[48] The intervention conducted in Burkina Faso differed from the interactional group discussion intervention as it mainly focused on improving injection safety.[49] Since 1995, the national drug policy aimed at opening public

sector community pharmacies that were located next to primary health care facilities. These primary health care facilities or community pharmacies offered essential medicines and single-use devices at low cost on the basis of a cost recovery scheme. This increased the access to injection devices. This led to an enhancement of the safety of injections in Burkina Faso.[49]

Discussion

In the "zone four" of the India CLEN study that included the state of West Bengal, unsafe and overuse of injections were documented in government health sector. The main reason of injection overuse was that prescribers overestimate the preference for injections among patients and in most cases; patients are open to the use of oral medications. The effectiveness of interactional group discussions between patients and prescribers to reduce injection overuse was documented in Indonesia. Moreover, the intervention was tested successfully to reduce injection overuse in Pakistan, Cambodia and Tanzania.

In Indonesia

Injections were overused with more than 60% of patients attending public health facilities receive at least one injection in 1992. Retrospective and controlled trial was conducted to assess the efficacy of an innovative behavioral intervention, the interactional group discussion for reducing injection overuse. A single district with 24 public health centers randomized to intervention and control groups. The hypothesized mechanism of behavior change involved reality testing prescriber's assumptions about patient beliefs, imparting scientific information about injection efficacy and establishing peer

norms about accurate behavior. Total 24 interactional group discussions were held in a month period. A retrospective prescription survey covering the periods three months before and three months after the intervention with samples of 100 prescriptions per center per month. A significant decrease in injection use from 70% to 42% in the intervention group compared to a decrease from 76% to 67% among controls. It presented effectiveness of the interactional group discussion to change certain types of behavior with long term impact.[45]

In Pakistan

Health care providers in Pakistan prescribe unnecessary injections resulting injection overuse.[24] A pilot intervention was conducted in informal private sector in Karachi to reduce injection overuse in 2003. For this 12 month intervention, 20 general practitioners were assigned to intervention and 20 others were used as control groups. The intervention consisted of interactional group discussions between patients and prescribers on the topic of the use of injections in common ailments and health education using pamphlets and posters. Pre intervention survey indicated that proportion of visits followed by an injection was 88% among patients in control groups and 84% among patients in intervention group. After intervention, this proportion was 87% in the control group but decreased to 51% in the intervention group.[46]

In Cambodia

In 2002, rapid assessment of injection practices indicated injection overuse.[42] Two factors led to the overuse of injections misunderstanding

between prescribers and patients and economic incentives for providers to prescribe injections. The Cambodian Ministry of Health conducted a randomized controlled trial with the objectives to reduce injection overuse in public health sectors through interactive group discussion to determine whether interactional group discussion were effective in Cambodia and address options to scale up this intervention. The study was conducted among prescribers in public referral hospitals in two strata, Kompong Cham province and in Phnom penh city. Scientific information and take home messages were supplied to the participants. The baseline survey indicated that the percentage of prescriptions with at least one injection 84% for the intervention group and 78% in for the control group in Kompong strata and 97% for intervention and 96% for control group in Phnom penh city. Post intervention data presented the percentage of prescriptions with at least one injection 61% for the intervention group and 77% in for the control group in Kompong strata and 76% for intervention and 95% for control group in Phnom penh city. This study indicated that interactional group discussion were effective in Cambodia in reducing injection overuse.[44,]

In Tanzania

Injection overuse was observed in a study conducted in1999 and 2001 in public and church owned primary health care facilities. More than 70% of patients received at least one injection. To assess the impact of interactional group discussion, a randomized controlled trial was conducted in 10 public and 10 private dispensaries in peri-urban Dar es Salaam, using 30 patient records from each facility randomly in 2003. The baseline study presented injections accounted 29% of prescribed medicines at public facilities and 37% at private facilities.[45]

In India, injection overuse and unsafe use of injections were reported from several studies and that included lack of awareness regarding risk, lack of injection equipment, and a lack of appropriate disposal of sharps.[29-37] Thus to achieve injection safety, approaches should combine behaviour change strategies, provision of supplies such as auto-disable syringe and set up of a waste management system. However, the task of making injections safe would be convenient if the frequency of injection were reduced. Improvement of injection practices requires behaviour change that needs to be induced through information, education and communication activities in a supportive environment. Moreover, sustained behaviour change requires more than transfer of information as other elements need to be addressed including attitudes, emotions, belief, systems and norms. However, pilot interventions should be conducted in a district where unsafe injection practices have been documented. In interactional group discussion, expected behaviour change among prescribers in prescribing oral medication rather than an injection is required. Reasons for current behaviour of unnecessary injection prescriptions are inadequate policy for prescribing injections, barriers to change the inappropriate or absence of standard treatment guideline, and wrong perception among prescribers about "more potent, more fast, more preferred" concept of injections.

Use of sterilizable syringes and needles is cost-effective and produces smaller quantities of waste. However, adequate supplies, maintenance and supervision may not be feasible in India. New auto disable syringes can limit the reuse since they inactivate themselves by locking the plunger after use. It is now used in Universal immunization programme in India. The WHO/ UNICEF bundling strategy now recommends the inclusion of the costs of

injection safety in estimates for the expense. In the United States where hepatitis B virus and hepatitis C virus infection are not common, the overall cost of these infections is estimated at US $ 1.3 billion. Thus cost of unsafe injection in developing countries is high as unsafe and overuse of injections account for a large proportion of new cases of hepatitis B and hepatitis C virus infection. Through interactional group discussion, unnecessary injections can be prevented including unsafe injections. Thus this intervention contributes to the prevention of blood borne pathogens in the community. It constituted a highly cost-effective intervention. Oral alternative medications are available for many injections. Most medications used in primary care could be administered orally. Injections are needed mainly for life threatening conditions, malabsorption syndromes, inability to swallow, vomiting or no alternative oral medicines available and are mainly needed in hospital settings. Moreover, interactional group discussion and using single use injection equipment may lead to a reduction of 8,856,461 DALYs.[28]

The studies in Pakistan and in Cambodia supported the hypothesis that interactional group discussions were effective to reduce overuse of injection in private and public health sectors respectively. One of the most effective ways to prevent injection-associated infections is to reduce the number of injections administered. Since, unsafe and overuse of injections were present in West Bengal and interactional group discussion was reported effective in reducing injection overuse in other settings, we proposed a study that could be conducted to determine whether interactional group discussions will be also effective in reducing injection overuse in West Bengal.

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