

Use of syndromic management algorithm for Sexually Transmitted Infections and Reproductive Tract Infections management in community settings in Karachi

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Abstract

Objective: Syndromic management is promoted as a measure to manage and control STIs in resource poor settings. This research was conducted to assess the diagnosis and prescription patterns using syndromic management algorithms as part of a community-based reproductive health programme.

Methods: The research was conducted in four squatter settlements of Karachi. Health care providers working for a reproductive health programme in these settlements received similar training on the use of algorithms. The people in these settlements had comparable socioeconomic and cultural backgrounds and access to health services. The medical records of 400 women who attended the centres for RTI/STIs were randomly selected. These records were reviewed for diagnosis and prescription patterns.

Results: The diagnoses by and prescription practices of the health care providers differed greatly across the four clinics. As often there are more than one etiologic agents for most of the STI/RTI syndromes, algorithms allow multiple antibiotics use. However, this research pointed that despite diagnosing many patients as suffering from one particular infection, a large number of patients were prescribed more than one antibiotic.

Conclusion: It appeared that the health care providers had difficulties in using the algorithms, pointing to the need for ongoing support and training. The difficulty in correctly diagnosing STIs/RTIs could be the reason for over prescription. There is likelihood that the use of algorithms without sufficient support might contribute to the problems of drug resistance and prescription of drugs when they are contraindicated. Effective use of syndromic management algorithms requires training for effective communication, understanding about the locally prevalent STIs & RTIs, and periodic assessments of the quality of services.

Keywords: Sexually transmitted infections, Reproductive tract infections, Syndromic management, Developing countries (JPM 61:453; 2011).

Introduction

Sexually transmitted infections (STIs) are highly prevalent in developing countries, and are one of the leading causes of poor maternal health and health of baby.¹ In a review of studies estimating prevalence of STIs across developed and developing countries, Mullick et al reported prevalence of Gonorrhoea up to 7%, Chlamydia 21%, Bacterial Vaginosis 48%, and Trichomonas 27%.² These infections are associated with preterm labour, preterm delivery, premature rupture of membranes, and intrauterine growth retardation and low birth weight babies. In an STI prevalence study in Pakistan, which explored the prevalence of STI symptoms, it was reported that 63% of women respondents had vaginal discharge, 27% burning micturition, 70% backache, and 37% pain during sexual intercourse.³ It is, however, to be noted that while studies point to high prevalence of reported symptoms, the research involving laboratory investigations report a lower prevalence of STI. For example, a study in Nepal that used urine laboratory test to validate STI diagnoses found low prevalence of gonorrhea (2.3%) and Chlamydia (1%) among postpartum women. That study also highlighted that

symptoms such as low abdominal pain, vaginal discharge and burning micturition did not correlate with laboratory based STI diagnosis.⁴ On the other hand, many infections remain asymptomatic. A study involving married women 18-49 years of age in Vietnam, which confirmed STI using laboratory diagnosis, reported that 50% of the confirmed cases were asymptomatic.⁵

Considering the impact of RTI/STIs on women's health and on health of mother and babies, it is of paramount importance that primary health care programmes in general and the reproductive health programmes and services provide access to effective care and control at the population level. STIs can easily be diagnosed using the available laboratory tests. However, laboratory assistance is not available in many resource poor communities. Syndromic management is promoted in those settings. Syndromic management involves identification of signs and symptoms pointing to sexually transmitted infections, and treatment based on those signs and symptoms. There are, however, various limitations of syndromic management including missing asymptomatic infections, over-treatment, and poor sensitivity and specificity of algorithms in correctly diagnosing the

infections,⁶ particularly for women. Therefore, while it is important to include in reproductive health programmes and primary care services, management of STIs using algorithms, it is necessary that such management is continually assessed for effectiveness.

Pakistan Voluntary Health and Nutrition Association (PAVHNA) is a resource institution working with many community-based organisations (CBO). PAVHNA and its partner CBOs provided reproductive health services to eight communities in Karachi's squatter settlements and in other communities across Pakistan. The comprehensive Reproductive Health (RH) package also includes provision of education on RTI/STIs and their management using syndromic management algorithms. The married women between the ages of 15-49 receive STI related health education provided by the community health workers. The doctors and midwives provide syndromic management care at clinics. This research, as part of the RH programme of PAVHNA, was conducted with the objective of assessing the implementation and identifying syndromic management practices at the programme clinics. The study was needed in order to identify the treatment and prescription patterns, to determine the need for further training of medical staff, and to define the need and strategy for further health education at the centre and by the outreach workers.

Methods

Four squatter settlements in Karachi, where PAVHNA provided RH services, were chosen for the purpose of assessing the implementation of syndromic management services.

Using the clinic records of 400 women, 100 from each of the four sites, were randomly selected from amongst those who had received STI treatment at PAVHNA clinics. As an additional focus of PAVHNA programme is on maternal and child health, married women of 15-49 years of age are provided home-based health education on MCH and RH including sexually transmitted infections. As the programme focuses on RH and MCH, all of the health care providers in the programme are women, and a large majority of the recipients of care are women also. Therefore, married women of 15-49 years of age were included for this research. The women had received treatment from medical practitioners or midwives at the clinics for symptoms and signs of RTI/STIs. In addition to the existing RH knowledge and skills, these doctors and midwives had received additional training from a RH specialist on using syndromic management algorithms.

The names, addresses and any other identifying information about these patients were not known to the reviewers and those taking part in this research. The health

care providers at the clinics who already had access to the medical history of individual patients attending their respective clinics were asked to provide data about the symptoms, diagnosis, and treatment of these 400 women as noted in their medical record sheets. PAVHNA approved the research after consulting the respective community-based organisations and the health care workers in those settings. The research was approved after careful consideration to the process of protecting privacy and confidentiality and after ensuring that the outreach workers visiting homes do not have access to individual patients' medical record or diagnosis.

Settings:

The research was conducted in Korangi, Landhi and Malir areas of Karachi where PAVHNA and its partner community based organisations (CBOs) had established reproductive health programmes. The socioeconomically disadvantaged communities in tehsel settlements suffered from high burden of morbidity and had less than adequate access to health care. People in these areas worked on unskilled and semiskilled jobs. Many others operated small shops.

Outreach workers of partner community based organisations visited every household in the catchment areas (20,000 households in each site) once every three months. Therefore, the health care teams had a good understanding about the overall socioeconomic and cultural context and health and health care access for the locals. On the basis of these ongoing observations and understanding it could be confidently said that there was not much difference amongst this population in terms of the socioeconomic status, health knowledge, morbidity and access to care.

A baseline survey conducted at the start of the programme pointed to the contraceptive prevalence rate ranging from 20 to 40% for married women of 15-49 years of age. Amongst those who used contraceptives, condom use was 21 to 39%. That baseline survey indicated a pregnancy rate of about 10% amongst married women of 15-49 years of age.

Generally the communities in those settings accessed government hospitals for inpatient care and received outpatient primary care from local private medical practitioners. Other than PAVHNA RTI/STI related education and services, the communities had little or no access to STI education and care.

Results

Out of the randomly selected 400 patients whose records were reviewed, the information whether these respondents were seen by midwives or doctors was available for 357 respondents. About 30% patients received STI/RTI treatment from doctors, whereas others were provided

Table-1: STI symptoms as noted in the medical record.

Symptoms	Field Sites				Total as reported in medical record N=382 (%)
	Peri Urban N=100 (%)	Korangi N=99 (%)	Landhi N=85 (%)	Malir N=98 (%)	
Whitish Discharge	95.0	85.9	81.2	76.5	84.4
Yellowish Discharge	14.0	19.2	20.0	21.4	18.6
Foul Smelling Discharge	34.0	20.2	22.4	26.6	25.9
Itching	17.0	7.1	15.3	7.1	11.5
Lower back ache	35.0	75.8	44.7	30.6	46.6
Lower Abdominal Pain	43.0	45.5	18.8	11.2	30.1
Dyspareunia	10.0	1.0	2.4	3.1	4.2
Burning Micturition	14.0	4.0	3.5	4.1	6.5

Table-2: Diagnoses as noted in the medical records.

Diagnoses	Field Sites				Total N=385 (%)
	Peri Urban N=100 (%)	Korangi N=99 (%)	Landhi N=87 (%)	Malir N=99 (%)	
Candidiasis	17.0	12.1	8.0	39.4	19.5
Trichomonas	32.0	19.2	49.4	15.2	28.3
Chlamydia	9.0	1.0	0	4.0	3.6
Bacterial Vaginosis	58.0	51.5	25.3	52.5	47.5
Gonorrhoea	5.0	1.0	1.1	3.0	2.6
Cervicitis	0	19.2	37.9	0	13.5

Table-3: Drugs prescribed by the attending physician (doctor/midwives).

Medicines	Field Sites				Total N=385 (%)
	Peri Urban N=100 (%)	Korangi N=99 (%)	Landhi N=87 (%)	Malir N=99 (%)	
Metronidazole	81.0	97.0	79.3	88.9	86.8
Ciprofloxacin	8.0	0	37.9	62.6	26.8
Doxycycline	27.0	3.0	36.8	33.3	24.7
Oxytetracycline	71.0	92.9	3.4	1.0	43.4
Clotrimazole Pessary	10.0	3.0	39.1	2.0	12.7
Nystatin Pessary	4.0	51.5	11.5	12.1	20.0
Others	10.0	32.3	14.9	7.0	16.1

treatment by midwives.

Whitish vaginal discharge and backache were the symptoms most frequently noted in the medical records (Table-1). There are differences between field sites. For example, while at Peri-Urban field site the service providers noted 43% of patients suffering from lower abdominal pain, only 11.2% of patients were diagnosed with lower abdominal pain in Malir area.

Table-2 provides information on diagnoses made for women presenting with STI symptoms. The health care provider noted diagnosis in the medical records of the patients. However other than documenting the main symptoms, the syndromes were not mentioned, and the antibiotics were prescribed for the noted diagnosis. The most frequent (47.5%) diagnosis, except at Landhi, was bacterial vaginosis. There were, however, substantial differences between field sites. For example, the health care providers at

Landhi diagnosed about 38% women with cervicitis, whereas no one was diagnosed with this condition at Malir and Peri-Urban clinics. The health care providers at all sites were similarly trained for clinical examination and for the use of syndromic management algorithms. They did not report any difference in term of clinical examination procedures such as the use of speculum for examination. Similarly, 49.4% women in Landhi were diagnosed with Trichomonas compared to only 15.2% at Malir. However, it is to be noted that these diagnoses were made clinically, without laboratory investigations.

Similarly, there were inter-site differences in terms of drug prescription practices (Table-3).

Metronidazole was prescribed to a larger majority (86.8%) at all sites, despite that there were large differences between sites in terms of diagnoses of various infections. At the same time, there were big differences between sites in

terms of the use of various other antibiotics. For example, Nystatin pessary was prescribed to more than 50% patients compared to its prescription to less than 10% patients at all other field sites.

Discussion

The algorithms are promoted for low resource environment as they can be used by health care providers other than medical practitioners.⁷ It appears that in our case, the health care providers, doctors and midwives, had difficulties in using the Syndromic Management Algorithm. This situation points to the need for ongoing training support.

At present many developing countries suffer from shortage of adequately trained human resource particularly in urban squatter settlements and rural areas. Within this context, nongovernmental organisations and government health departments provide centre-based and outreach care through community health workers, midwives and lady health visitors. Therefore, it is required that low cost but effective medical technologies are available to and appropriately used in such settings by the available health care providers. However, our research suggests that there is a likelihood that the use of algorithms in such context could lead to over or incorrect diagnoses, and over or under prescription. Similar to the results of our study, a study from Nepal about the syndromic management practices of chemists highlighted that only a small percentage of trained health care providers prescribed medicine correctly.⁸

Our research pointed to probable over-prescription; almost all patients were prescribed antibiotics, many were prescribed more than one. This may reflect a pattern of over prescription in primary care in general. It would be useful that future studies compare the use of antibiotics in general with the use of antibiotics for STI in the same population.

Despite that these settlements were similar in relation to socioeconomic disadvantage, cultural background, health awareness, demography, availability of private and government medical services, the large inter site differences in terms of diagnoses such as cervicitis need to be discussed and further explored. Research has shown that the algorithms for diagnosing cervicitis or vaginitis have low predictive values and for that reason training and improved quality of history taking are recommended.⁹ In case of our research, while health care staff did not report any difference in terms of history taking or clinical examination, it was difficult to ascertain if there were in fact some differences across the sites because the details of clinical examination were not recorded in the medical record sheets of individual patients.

The finding that a majority of patients were labelled

as suffering from one STI only but that they were prescribed more than one medication requires further examination. More than one medication might be justified; for example, patients suspected of having chlamydia infection should be treated for gonorrhoea as well. However, the fact that ciprofloxacin or other drugs recommended for gonorrhoea were not prescribed in these cases reflected the immediate need for retraining. It seems that the health care providers were unsure of the diagnosis and as a consequence prescribed drugs to cover multiple infections; this defeats the purpose of syndromic management as it is intended to assist health care providers in diagnosing and appropriately managing the infections. Therefore, it would be better to note, in the medical record, the symptoms and syndromes. Syndromes have often more than one etiological factor and for that reason more than one antibiotic may be needed.

The finding that there were differences between the field sites with regard to the types of drugs prescribed, points to the need for identifying the reasons for such prescribing behaviour, and for providing further training if needed, and supportive supervision. The extent of the difference in drug prescription is not fully justifiable on the basis of the differences in diagnoses across various communities in this research. The inter-site differences could be because of the differences in the supply and availability of drugs at the clinics. The differences could also be due to a lack of knowledge on what to prescribe in ambiguous situations.

Doxycycline and oxytetracycline should be avoided in pregnancy and for those women who are breastfeeding. Similarly, metronidazole should be avoided in the first trimester of pregnancy.¹⁰ With high prescription rates of these medicines there is a likelihood that some of the women who are pregnant or breastfeeding may receive the contraindicated drugs. Research has pointed out that algorithms have low sensitivity with the potential for over treatment and incorrect labelling of women as having STIs/RTIs.⁹ Tann and colleagues reported the sensitivity of syndromic management for Bacterial Vaginosis as only 50% when used by health workers.¹¹ It has been pointed out that algorithms use, particularly in low prevalence areas, leads to treatment of women with no clinically significant STIs.¹² The use of algorithm should be supported by periodic assessment of the locally prevalent STIs. An understanding about the relative prevalence of various RTIs/STIs in the area could then be used to improve the training of health care personnel for effective use of algorithms for locally prevalent infections. Syndromic management has been an effective tool in managing RTI/STI burden in resource poor settings. However, there are limitations of syndromic management. If not reviewed there may be health implications for mothers and babies as infections are not

appropriately managed and/or women receive inappropriate medication. This has the potential to affect pregnancy outcomes as well. We agree with Vuylsteke that there should be regular reviews and appropriate actions such as provision of some rapid point of care tests to change/strengthen the services in light of the local epidemiological patterns.⁴

The ineffective use of algorithms could also be because of the difficult nature of communication regarding sensitive issues of sex and vaginal discharge. In some cultures, people may find it difficult to communicate about these issues even when the interaction is with a same sex health care provider. The utility of the syndromic management algorithm depends on systematic questioning and clear and elaborate answers. Despite adequate technical training, the providers of care may not feel comfortable asking questions such as whether the patient has pain while having sex and whether these symptoms have recently appeared. Therefore, it is required that the communicative aspect of health care training within the particular culture is privileged.

The health facilities and programme utilising syndromic management algorithms will benefit from periodic assessments and the health care providers may require further training with a particular focus on appropriate use of antibiotics and implications for the health of mothers and babies. Additionally, it is required that the programme and health services have access to current epidemiological information about locally prevalent infections. If resources permit then addition of some rapid point of care tests should be included in the programmes. In addition to epidemiological reviews, the research should also focus on quality of care issues including the cultural context and communicative aspect of provider-patient interaction.

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References

1. World Health Organization. Global prevalence and incidence of selected curable sexually transmitted infections: overview and estimates. Geneva: WHO, 2001.
2. Mullick S, Watson-Jones D, Beksinska M, Mabey D. Sexually transmitted infections in pregnancy: prevalence, impact on pregnancy outcomes, and approach to treatment in developing countries. *Sex Transm Infect* 2005; 81: 294-302.
3. National AIDS Control Program, Summary - STI prevalence study in Pakistan 2000-2001. (Online) (Cited 2009 April 16). Available from URL: <http://www.nacp.gov.pk/wp-content/uploads/2007/04/summary-sti-prevalence-study-in-pakistan-2000.pdf>.
4. Christian P, Khatry SK, LeClerq SC, Roess AA, Wu L, Yuenger J D, Zenilman J M. Prevalence and risk factors of chlamydia and gonorrhea among rural Nepali women. *Sex Transm Infect* 2005; 81: 254-8.
5. Lan PT, Lundborg CS, Phuc HD, Sihavong A, Unemo M, Chuc NT, et al. Reproductive tract infections including sexually transmitted infections: a population-based study of women of reproductive age in a rural district of Vietnam. *Sex Transm Infect* 2008; 84: 126-32.
6. Vuylsteke B. Current status of syndromic management of sexually transmitted infections in developing countries. *Sex Trans Infect* 2004; 80: 333-4.
7. World Health Organization/Global Programme on AIDS. Management of sexually transmitted diseases, WHO/GPA/TEM/94.1. Geneva: WHO, 1994.
8. Khan MM, Wolter S, Mori M. Post-training quality of syndromic management of sexually transmitted infections by chemists and druggists in Pokhara, Nepal: is it satisfactory? *Int J Qual Health Care* 2006; 18: 66-72.
9. Vishwanath S, Talwar V, Prasad R, Coyaji K, Elias CJ, I de Zoysa. Syndromic management of vaginal discharge among women in a reproductive health clinic in India. *Sex Transm Infect* 2000; 76: 303-6.
10. World Health Organization. Integrating care for reproductive health, sexually transmitted and other reproductive tract infections; a guide to essential practice. Geneva: WHO, 2004.
11. Tann CJ, Mpairwe H, Morison L, Nassimu K, Hughes P, Omara M et al. Lack of effectiveness of syndromic management in targeting vaginal infections in pregnancy in Entebbe, Uganda. *Sex Transm Infect* 2006; 82: 285-9.
12. Hawkes S, Morison L, Foster S, Gausia K, Chakraborty J, Peeling RW, et al., Reproductive-tract infections in women in low-income, low-prevalence situations: assessment of syndromic management in Matlab, Bangladesh, *Lancet* 1999; 354: 1776-81.