Alternative algorithms for syndromic diseases management to minimize the misuse / over-use of antibiotic in non-viral Sexually Transmitted Infections

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Introduction : Syndromic approach is a simple and affordable approach for STI management in low resource countries. However, due to lack of confirmation and accuracy, risk of over-use/misuse of antibiotic is very high. In this study, we propose a more specific and accurate algorithm compared to current algorithm used for syndromic case management with laboratory outcome.

Methods : The study is divided into two categories; Category I- Based on existing NACO-NACP guidelines symptoms of infection were scored and patient were treated, Category II, in alternative syndromic approach all the samples were tested by PCR for *C. trachomatis* (CT), *N. gonorrhoeae* (NG) and *T. vaginalis* (TV) before giving treatment.

Results: For category I, amongst 646 syndromically infected women, only 46 (7.13%) tested positive by PCR assay for one the pathogen while rest of 600 (92.87%) were negative for these three pathogens. The total estimated percentage of the overuse and misuse of antibiotics is 84.52% and 15.48% respectively. Correct and complete treatment based on laboratory outcome compared to NACP was 42/46 (91.30%). The estimated overuse of antibiotics prevalence of Azithromycin and Cefixime was (55.49%), combination of Dixycilin, Cefixime, Metrodizonole (30.95%) and combination of Dixycilin, Cefixime, Metrodizonole, Azithromycin (13.55%). For category II, wherein patients were treated using alternative syndromic approach and compared with PCR diagnostics, 243/319(76.15%) subjects were infected with either one of the pathogen (NG/TV/CT), whereas 76/319(23.82%) women were negative for any of these three pathogens. Amongst 243 infected patients, 99(40.74%) were infected with single pathogen while 144/243 (59.2%) was co-infected. Prevalence of TV, NG & CT was 13.13%, 65.65% and 21.21% respectively. Co-infection with CT + NG was highest, 51.38% (74/144) followed by infection with all the three pathogens (30%). Co-infection with CT + TV was 9.72% and NG + TV was 9.03%. The estimated overuse of antibiotics was only 24%.

Conclusions : The proposed alternative algorithms can reduce the rate of misuse / over-use of antibiotics from 92% to 24%.

Keywords: India, NACO, alternative algorithms, STI, PCR, antibiotics, *C. trachomatis*, *N. gonorrhoea*, *T.vaginalis*.

Figure: 1. Management and treatment guidelines for symptomatic patients through syndromic case management

Figure 2: Treatment roadmap used to minimize infection

Table: 1. List of primer sets specific for different pathogens used in the present study.

S.N.	Microorganisms	Gene	References	Primers Sequences
1	<i>C. trachomatis</i>	gyrA	Patel et al., 2009	C2 5'TGATGCTAGGACGGATTAACCC3' C5 5'TTCCCTAAATTATGCGGTGGA3'
2	<i>N. gonorrhoeae</i>	Orf1	Chaudhary et. al. 2002	F 5'CAACTATTCCCGATTGCGA3' R 5'GTTATACAGCTTCGCCTGAA3'
3	<i>T. vaginalis</i>	pfoB	Sonkar et al., 2016	F 5'CAAAGTCAACATGGCTATGAT3' R 5' GAAGACCTGTGTGGATGGATGT 3'

Figure: 1. Alternative algorithms for syndromic diseases management for symptomatic patients through syndromic case management