Is syndromic management better than the current approach for treatment of STDs in China? Evaluation of the cost-effectiveness of syndromic management for male STD patients

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The use of syndromic management to manage sexually transmitted diseases (STDs). The approach made use of a modified World Health Organisation (WHO) syndromic algorithm to diagnose STDs, followed by standardised treatment determined by WHO protocol.

Type of intervention
Diagnosis and treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised men reporting genitourinary symptoms in clinics in China. No exclusion criteria were specified.

Setting
The setting was the community. The economic study was carried out in China.

Dates to which data relate
The effectiveness and resource use data related to 2000. The authors specified the price year as 2000 in a previous publication. (see "Other Publications of Related Interest" below).

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
No power calculations to determine the sample size were reported. Men reporting genitourinary symptoms were invited to participate in the study. This sample of men presenting at clinics with genitourinary symptoms is likely to be typical of those who would be available for syndromic management. Four hundred and seventeen men were identified and were invited to participate in the study. Of these, 11 (3%) refused. Thus, the final sample comprised 406 men (97%), of whom 350 (86%) had urethral discharge or dysuria symptoms, 55 (14%) had genital ulcers, and 1 (0.3%) had urethral
discharge and genital ulcers. It appears that a further 3 (1%) men with urethral discharge or dysuria, and the one man with both urethral discharge and genital ulcers, were excluded from the analysis. Correspondence with the authors’, after this abstract was written, has informed us that failure to obtain urine tests was the reason for excluding three of the men, the fourth man (with both urethral discharge and genital ulcers) was excluded to simplify the analysis. The diagnostic results obtained for this sample of patients with the current standard approach were compared with the hypothetical diagnostic results that would have been obtained with syndromic management. The demographic characteristics of the patients included in the study were not presented.

**Study design**

The study was a case series identified in local STD clinics in China. The authors did not state whether the patients were recruited from more than one site. Correspondence with the authors, after this abstract was written, states that the clinics were selected according to three criteria. Firstly, at least one new patient per day sought medical service at the clinic. Second, as there were four districts, only one clinic from each was selected for inclusion. Finally, the STD clinics staff were cooperative. The local health department ran two of the clinics and two were private clinics. The patients were followed to determine their diagnosis and treatment under current practice, and to determine their ‘gold’ standard diagnosis according to the Chinese National Centre for STD Control and Prevention. Four (1%) patients appear to have been lost to follow-up since they were not included in the analysis.

**Analysis of effectiveness**

Not all of the patients included in the study were accounted for in the analysis. The analysis of effectiveness was evaluated using the numbers of people correctly treated, incorrectly treated or overtreated under the two approaches (current practice and syndromic management). Correct treatment was defined as a correct diagnosis (as determined by the Chinese National Centre for STD Control and Prevention), and appropriate drug treatment. Incorrect treatment was defined as a wrong diagnosis and the treatment of that infection with drugs inactive against the true infection. Overtreatment was defined as the diagnosis, and subsequent treatment, of a condition that was later proved absent. The sensitivity, specificity and positive predictive values for syndromic management were also estimated.

**Effectiveness results**

Of the 347 patients with urethral discharge or dysuria, current practice correctly treated 121 (35%) patients with gonorrhoea and/or chlamydia, incorrectly treated 119 (34%), and overtreated 107 (31%) who were not infected. Under syndromic management, 240 (69%) patients with gonorrhoea and/or chlamydia would have been correctly treated, and 107 (31%) would have been overtreated.

Of the 55 men with genital ulcers, 53 were confirmed as having genital ulcers. Of those with confirmed genital ulcers, current practice correctly treated 12 (23%) patients with syphilis, incorrectly treated 1 (2%), and overtreated 10 (19%) who were not infected. Under syndromic management, 13 (100%) patients with syphilis would have been correctly treated, and 40 (75% of men with genital ulcers) patients without syphilis would have been overtreated.

For men with urethral discharge or dysuria, the sensitivity of syndromic management was 100%, the specificity was 0%, and the positive predictive value was 69%.

For men with confirmed genital ulcers, the sensitivity of syndromic management was 100%, the specificity was 5%, and the positive predictive value was 25%.

**Clinical conclusions**

The authors concluded that, if syndromic management had been used, 77 (49%) men with gonorrhoea, 7 (25%) men with chlamydia, and 35 (65%) men with both infections who were incorrectly treated under current practice would have received the correct treatment. They concluded that overtreatment is no more of a problem under syndromic management than under current practice due to the low level of accuracy in current practice.
Measure of benefits used in the economic analysis
The benefit measure in the economic analysis was the number of patients correctly treated. This was also used as an effectiveness outcome in the clinical study.

Direct costs
The costs were for the laboratory tests, the examination, drugs, health education and condoms. The quantities and the unit costs of the drugs used in current practice were not specified. The author's have since informed us that this was due to the space constraints placed upon them by the journal. The prices and costs were estimated on the basis of observed prices and resource use in the study setting. Discounting was not relevant. The study reported the average cost per correct treatment, per incorrect treatment and per overtreatment. It also reported the median cost per treatment under current practice. The cost data were typically right-skewed, so the majority of patients will incur costs lower than the mean. The median therefore has greater descriptive value for the typical patient's costs. The study also reported the total cost of current practice and the expected total cost of syndromic management. The resource use quantities were not reported separately from the costs for current practice.

Statistical analysis of costs
The costs were treated deterministically as the study simply compared the mean and total costs of current practice and syndromic management. This may limit the generalisability of the study.

Indirect Costs
The indirect costs were not included in the analysis, which was inline with the perspective adopted.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was undertaken.

Estimated benefits used in the economic analysis
Under current practice, 121 (30%) men presenting with urethral discharge or dysuria were correctly treated, and 12 (32%) men presenting with genital ulcer were correctly treated. Under syndromic management, 240 (69%) men presenting with urethral discharge or dysuria would have been correctly treated, as would 13 (25%) men presenting with genital ulcers.

Cost results
The total cost of using syndromic management in the study sample was $756.46 for men presenting with urethral discharge or dysuria, and $175.96 for men presenting with genital ulcers.

The total cost under current practice was $39,141.11 for men presenting with urethral discharge or dysuria, and $1,027.89 for men presenting with genital ulcers.

The costs of adverse effects to treatment or knock-on costs were not considered. The costs were reported in US dollars, and the method of converting from the local Chinese currency was not reported.

Synthesis of costs and benefits
The costs and benefits were synthesised to provide the cost per correct treatment.
Under current practice, the median cost was $84.27 per correctly treated case of gonorrhoea, $158.30 per correctly treated case of chlamydia, and $177.42 per correctly treated case of gonorrhoea with concurrent chlamydia. These conditions are found in men presenting with urethral discharge or dysuria, and the mean cost per correct treatment in this group was $323.48.

The median cost per correctly treated case of syphilis was $27.20. Syphilis is found in men presenting with genital ulcers, and the mean cost per correctly treated man with genital ulcers was $85.65.

Due to the uniform pattern of treatment under syndromic management, the mean cost was equal to the median.

Under syndromic management, the mean cost per correctly treated man presenting with urethral discharge or dysuria was $3.15. The mean cost per correctly treated man presenting with genital ulcers was $13.54.

Authors' conclusions
Syndromic management with a modified World Health Organisation (WHO) algorithm would be cost-effective in the treatment of men with sexually transmitted diseases (STDs) in China, and it would be easy to implement such a programme. Syndromic management is superior to current practice in the correct treatment of men infected with gonorrhoea, chlamydia and syphilis, and is also superior overall on overtreatment.

CRD COMMENTARY - Selection of comparators
The choice of the comparator represented current practice, and no attempt was made to formalise this for the study. You should consider whether current practice, as described in this setting, is relevant to your own setting.

Validity of estimate of measure of effectiveness
The analysis used a case-series in the local setting, which was appropriate for assessing the cost-effectiveness of using syndromic management in that setting. The algorithm used in syndromic management was adapted to the particular characteristics of the patients in the effectiveness sample. The study sample is likely to have been representative of the local population, but whether it would be generalisable to other settings is uncertain. You should consider whether the pattern of STD and the modified WHO algorithm in the effectiveness analysis are relevant to your own setting. The effectiveness analysis used hypothetical results that would have been obtained on the sample of patients that had been diagnosed by current practice.

Validity of estimate of measure of benefit
The estimate of benefits (the number of correctly treated patients) was obtained directly from the effectiveness analysis. A side effect of syndromic management was the overtreatment of uninfected patients, which was also observed under current practice. The authors only considered cost, and not adverse clinical events or induced resistance to antibiotics, as a disbenefit of overtreatment. This could potentially offset some of the benefits of correctly treating a greater number of people. The authors considered the number of correctly treated patients for a variety of STDs, but did not comment on the relative value or severity of these disorders.

Validity of estimate of costs
The perspective used in the analysis was that of the patient. The study included only the direct medical costs, and not travel or indirect costs. The medical costs associated with adverse or knock-on effects of treatment were not considered. The omission of the costs of adverse effects may affect the authors' conclusions, as different numbers of patients would be treated with different drugs under current practice and syndromic management. The costs were not reported separately from the quantities for the cost analysis of current practice. The prices used were those observed in the effectiveness analysis, and no statistical analysis of these was performed. The method of transforming local costs from China into US dollars was not reported. The costs were incurred within one year, hence discounting was irrelevant.
Other issues
The authors compared the results of their study with common concerns held about the use of syndromic management. However, they did not compare their results with the findings from other studies. The authors did not present their results selectively. The authors' conclusions must be viewed within the limited scope of their study, which considered only the immediate direct medical costs of treatment. They concluded that syndromic management is a cost-effective approach in resource-poor countries, but the validity of applying their results outside the Chinese locality will depend on the nature and effectiveness of current practice, the incidence of STDs, and any modifications to the WHO algorithm.

Implications of the study
The authors recommended that syndromic management be introduced at a primary care level in China.

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Other publications of related interest

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