

Clinical effectiveness and cost-effectiveness of interventions for the treatment of anogenital warts: systematic review and economic evaluation.

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Abstract

BACKGROUND

Typically occurring on the external genitalia, anogenital warts (AGWs) are benign epithelial skin lesions caused by human papillomavirus infection. AGWs are usually painless but can be unsightly and physically uncomfortable, and affected people might experience psychological distress. The evidence base on the clinical effectiveness and cost-effectiveness of treatments for AGWs is limited.

OBJECTIVES

To systematically review the evidence on the clinical effectiveness of medical and surgical treatments for AGWs and to develop an economic model to estimate the cost-effectiveness of the treatments.

DATA SOURCES

Electronic databases (MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, EMBASE, The Cochrane Library databases and Web of Science) were searched from inception (or January 2000 for Web of Science) to September 2014. Bibliographies of relevant systematic reviews were hand-searched to identify potentially relevant studies. The World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.gov were searched for ongoing and planned studies.

REVIEW METHODS

A systematic review of the clinical effectiveness literature was carried out according to standard methods and a mixed-treatment comparison (MTC) undertaken. The model implemented for each outcome was that with the lowest deviance information criterion. A de novo economic model was developed to assess cost-effectiveness from the perspective of the UK NHS. The model structure was informed through a systematic review of the economic literature and in consultation with clinical experts. Effectiveness data were obtained from the MTC. Costs were obtained from the literature and standard UK sources.

RESULTS

Of 4232 titles and abstracts screened for inclusion in the review of clinical effectiveness, 60 randomised controlled trials (RCTs) evaluating 19 interventions were included. Analysis by MTC indicated that ablative techniques were typically more effective than topical interventions at completely clearing AGWs at the end of treatment. Podophyllotoxin 0.5% solution (Condyline(®), Takeda Pharmaceutical Company Ltd; Warticon(®) solution, Stiefel Laboratories Ltd) was found to be the most effective topical treatment evaluated. Networks for other outcomes included fewer treatments, which restrict conclusions on the comparative effectiveness of interventions. In total, 84 treatment strategies were assessed using the economic model. Podophyllotoxin 0.5% solution first line followed by carbon dioxide (CO₂) laser therapy second line if AGWs did not clear was most likely to be considered a cost-effective use of resources at a willingness to pay of £20,000–30,000 per additional quality-adjusted life-year gained. The result was robust to most sensitivity analyses conducted.

LIMITATIONS

Limited reporting in identified studies of baseline characteristics for the enrolled population generates uncertainty around the comparability of the study populations and therefore the generalisability of the results to clinical practice. Subgroup analyses were planned based on type, number and size of AGWs, all of which are factors thought to influence treatment effect. Lack of data on clinical effectiveness based on these characteristics precluded analysis of the differential effects of treatments in the subgroups of interest. Despite identification of 60 studies, most comparisons in the MTC are informed by only one RCT. Additionally, lack of head-to-head RCTs comparing key treatments, together with minimal reporting of results in some studies, precluded comprehensive analysis of all treatments for AGWs.

CONCLUSIONS

The results generated by the MTC are in agreement with consensus opinion that ablative techniques are clinically more effective at completely clearing AGWs after treatment. However, the evidence base informing the MTC is limited. A head-to-head RCT that evaluates the comparative effectiveness of interventions used in clinical practice would help to discern the potential advantages and disadvantages of the individual treatments. The results of the economic analysis suggest that podophyllotoxin 0.5% solution is likely to represent a cost-effective first-line treatment option. More expensive effective treatments, such as CO₂ laser therapy or surgery, may represent cost-effective second-line treatment options. No treatment and podophyllin are unlikely to be considered cost-effective treatment options. There is uncertainty around the cost-effectiveness of treatment with imiquimod, trichloroacetic acid and cryotherapy.

STUDY REGISTRATION

This study is registered as PROSPERO CRD42013005457.

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