The accuracy of serum chlamydial antibodies in the diagnosis of tubal pathology: a meta-analysis

Authors' objectives
To assess the discriminative capacity of Chlamydia antibody titres in the diagnosis of tubal pathology in subfertile patients.

Searching
MEDLINE (from January 1966 to December 1995) and EMBASE (from January 1988 to February 1996) were searched using the keywords 'laparoscopy' and words beginning with 'chlam'. The references of retrieved articles were examined for additional studies.

Study selection
Specific interventions included in the review
Studies of the diagnostic performance of Chlamydia antibody titres were eligible for inclusion. Studies using microimmunofluorescence (MIF) or immunofluorescence (IF), enzyme-linked immunosorbent assay (ELISA) and immunoperoxidase (IP) assay techniques were included.

Reference standard test against which the new test was compared
Studies using laparoscopy as the reference standard were eligible for inclusion. Tubal pathology was defined as any tubal occlusion (i.e. absence of filling or overflow), hydrosalpinx, or peritubal adhesions.

Participants included in the review
The participants were female patients with subfertility.

Outcomes assessed in the review
The outcome measures used in the review were the sensitivity, specificity, likelihood ratios and prevalence (calculated from primary data). Studies reporting insufficient data to construct a 2x2 contingency table were excluded.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Two independent authors extracted the data and a third author resolved any disagreements. Data to populate 2x2 contingency tables were extracted, as were details of assay methods and patient numbers.

Methods of synthesis
How were the studies combined?
The sensitivity, specificity and likelihood ratios were calculated for each study, and summary receiver operating characteristic (ROC) curves were constructed. The sensitivities and specificities were pooled to provide summary point estimates in cases where homogeneity could not be rejected (see Other Publications of Related Interest no.1).
How were differences between studies investigated?

Heterogeneity was assessed using the chi-squared test. Where heterogeneity appeared, logistic regression analyses were undertaken to evaluate whether the following influenced the discriminative capacity of Chlamydia antibody testing: the method of inclusion of patients, the type of verification to define criteria for tubal disease, or the assay. A Spearman correlation coefficient was used to examine the threshold effect (see Other Publications of Related Interest no.2), i.e. the possible effects on test performance of varying the cut-off points of Chlamydia antibody titres for test positivity.

Results of the review

Twenty-three studies (2,729 patients) were included.

The sensitivity of Chlamydia testing for tubal pathology varied between 21% (specificity 100%) and 90% (specificity 33 and 82%), while the specificity varied between 29% (sensitivity 86%) and 100% (sensitivity 21 and 54%). The tests indicated that there was significant heterogeneity (P<0.001).

The logistic regression indicated that the discriminative capacity of Chlamydia antibody testing varied significantly with the way the tubal pathology was verified, and with the method of Chlamydia antibody testing. A subgroup analysis was undertaken according to the Chlamydia antibody titre assay used and the definition of tubal pathology. Heterogeneity tests indicated that there remained significant heterogeneity within the subgroups. Spearman rank correlation coefficients for sensitivity and specificity within all subgroups defining tubal pathology as occlusion, hydrosalpinx, or adhesions were -0.75 for studies using MIF or IF, -1.0 for studies using IP assay, and -0.50 for studies using ELISA. Summary ROC curves for these three groups showed that the curve for MIF or IF crossed that for ELISA, with the latter being superior in the ranges where the sensitivity was greater than 68% and the specificity less than 82%. The ROC curve of the IP assay was inferior to the other three curves.

Authors' conclusions

The discriminative capacity of Chlamydia antibody titres when using ELISA, MIF, or IF in the diagnosis of any tubal pathology was comparable to that of hysterosalpingography (HSG) in the diagnosis of tubal occlusion. While Chlamydia antibody testing involves limited burden, it provides no details on the anatomy of the uterus or tubes.

CRD commentary

This was a generally well conducted and presented review. The objective was clear and the inclusion criteria were defined in terms of the interventions, reference standard, participants and outcome measures. The search strategy was reasonable, although no attempt to identify unpublished data was reported and publication bias was not assessed.

The reporting of the review methodology was limited. No inclusion criteria relating to study design were reported, neither was a method for assessing study quality. It is therefore difficult to assess the extent to which the conclusions of the review are vulnerable to biases introduced by methodological flaws in the primary studies. Similarly, the limited reporting of the participants' characteristics makes the generalisability of findings difficult to assess. The data analysis, however, was appropriate and clearly described.

The authors' conclusion, that the discriminatory capacity of Chlamydia antibody titres when using MIF, IF or ELISA in the diagnosis of tubal pathology is comparable to that of HSG, strays from the reported objective of the review. The review did not directly compare the performance of Chlamydia antibody titres with that of HSG, nor did it address the diagnostic performance of HSG; the latter formed the subject of a previous review by the authors (see Other Publications of Related Interest no.3). Given the limitations described, the conclusions of the review should be viewed with some caution.

Implications of the review for practice and research

Practice: The authors stated that Chlamydia antibody testing is more appropriate than HSG in selecting patients for laparoscopy. Rather than focusing on the detection of clinically relevant morphological abnormalities of the fallopian tubes, the subfertility work-up should produce a valid fertility prognosis. The choice of laparoscopy as the reference
standard for tubule pathology is, therefore, questionable. Chlamydia antibody testing is based on detection of prior infection, hence it does not provide any information on the severity of tubule disease. It is therefore unlikely to be a useful tool in assessing the prognosis of fertility.

Research: The authors did not state any implications for further research.

**Bibliographic details**

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**Other publications of related interest**

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Subject indexing assigned by NLM

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**Record Status**
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