Authors' objectives
To review the currently available literature on early-stage prostate cancer treatment in which pre-treatment serum prostate-specific antigen (PSA) levels were used to stratify patients, in order to determine whether any conclusions could be reached regarding the optimal therapy of the disease.

Searching
MEDLINE was searched from 1986 to 1996 for studies published in the English language, using the following search terms: 'prostatic neoplasms'; 'prostatic neoplasms' plus 'surgery'; 'prostatic neoplasms' plus 'radiotherapy'; 'prostate-specific antigen'.

Study selection
Study designs of evaluations included in the review
No requirements relating to study design were stated. The included studies appear to have been uncontrolled follow-up studies. The median follow-up periods ranged from 18 to 53 months in the surgical studies, and from 20 months to 14 years in the radiotherapy studies.

Specific interventions included in the review
Surgery (with or without adjuvant hormonal manipulation), or radiation therapy. Radiation therapy comprised either conventional external beam irradiation, 3-dimensional conformal radiation therapy, interstitial brachytherapy, neutron therapy, or adjuvant hormonal manipulation.

Participants included in the review
Patients with early-stage prostate cancer who could be stratified by pre-treatment PSA levels, in order to evaluate treatment outcome. Pre-treatment PSA values had to be recorded and grouped for subsequent evaluation, and post-treatment PSA values had to be continuously monitored.

Outcomes assessed in the review
The main outcome measure was the rate of biochemical control achieved by each treatment. The definitions of biochemical control used to evaluate the outcome, and the median follow-up in each study, had to be stated.

How were decisions on the relevance of primary studies made?
All articles were reviewed independently by three authors, to determine whether all the eligibility criteria were met.

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

Data extraction
A comprehensive data extraction form was devised, which was based on the eligibility criteria for the review. Data from the individual studies were extracted independently by three authors, and evaluated for accuracy.

Methods of synthesis
How were the studies combined?
Studies were analysed in a narrative manner, according to the type of treatment received.
How were differences between studies investigated?
Differences in how the patients were grouped by pre-treatment serum PSA, and the variability of definitions for biochemical control, were discussed narratively.

Results of the review
There were 3 studies of patients undergoing surgery, 8 studies of conventional radiotherapy, 2 studies of 3-dimensional conformal radiation therapy, and 5 studies of brachytherapy. No studies examining the outcome from either neutron therapy or adjuvant hormonal manipulation, and which met the inclusion criteria for the review, were identified.

The results for all therapies were extremely variable. The 3- to 5-year rates of biochemical control ranged from 48 to 100% for patients with pre-treatment PSA levels of less than 4 ng/mL, from 44 to 90% for PSA levels between 4 and 10 ng/mL, from 27 to 89% for PSA levels between 10 and 20 ng/mL, and from 13 to 80% for PSA levels of over 20 ng/mL. No single treatment option consistently produced superior results.

Authors' conclusions
The use of pre-treatment serum PSA levels to stratify patients with early prostate cancer failed to indicate whether surgery or radiotherapy was a consistently superior treatment option. Standard definitions of disease stage and biochemical cure must be adopted, and longer follow-up must be obtained, if treatment efficacy is to be evaluated and patients are to be advised on treatment options.

CRD commentary
This systematic review was of average quality. The study objective was clear, and the literature search and inclusion criteria were described. Some study details were provided and the narrative summary was appropriate. The search was limited to only one database (MEDLINE), such that additional studies could have been missed. No study design requirements were outlined and 'early-stage' prostate cancer was not defined. No validity assessment was conducted and the designs of the included studies were not described, thus making it impossible to judge the reliability of the study results. In addition, the actual clinical relevance of serum PSA levels for patient outcomes was not made explicit in the study. The authors' conclusions appear justified given the limitations of both the review and the included studies.

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