Efficacy of stimulants in adult ADHD
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CRD summary
This review assessed stimulants as a treatment for adults with attention-deficit hyperactivity disorder. The quality of most of the studies was poor and there is little evidence on the effectiveness of long-term treatment. It is reasonable for the author to conclude that stimulants may be effective.

Authors' objectives
To assess the efficacy of stimulants to treat adults with attention-deficit hyperactivity disorder (ADHD).

Searching
MEDLINE was searched from 1966 to 2002; the search terms were reported. The reference lists in identified articles were checked and drug manufacturers were contacted. Studies reported in English were eligible for inclusion in the review.

Study selection
Study designs of evaluations included in the review
Eligibility criteria were not stated. The review included mostly double-blind trials of a crossover design, a few parallel-group double-blind trials, an open study with no control group and a retrospective chart review. The study duration ranged from 5 to 18 weeks.

Specific interventions included in the review
Studies of stimulants were eligible for inclusion. The stimulants used in the included studies were methylphenidate, dextroamphetamine, mixed amphetamine salts and pemoline. The mean daily dose varied between studies. The controlled trials included in the review were placebo-controlled, except for one in which methylphenidate was compared with lithium.

Participants included in the review
Studies in adults with ADHD were eligible for inclusion. The diagnosis criteria used in most of the included studies was the Diagnostic and Statistical Manual of Mental Disorders-IV checklist 4th edition (DSM-IV) and/or DSM-III-R (3rd edition revised).

Outcomes assessed in the review
Eligibility criteria were not stated. The primary response criteria reported in the included studies were Clinical Global Impression Scale 1 or 2 (or equivalent), 30% reduction in ADHD Rating Scale, DSM-IV ADHD and clinical impression.

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

Assessment of study quality
The author appears to have assessed study quality but did not report a method. The criteria alluded to include sample size, drop-out, study duration, length of washout period in crossover trials and assessment tools. The author did not state how the papers were assessed for quality, or how many reviewers performed the quality assessment.

Data extraction
The author did not state how the data were extracted for the review, or how many reviewers performed the data.
extraction. The outcome data extracted from each study were based on the number of participants who completed assessment.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative.

How were differences between studies investigated?
In the narrative, the studies were grouped by the stimulant used (methylphenidate, amphetamines, or pemoline). Possible reasons for conflicting results were discussed.

Results of the review
Thirteen studies were included: 8 crossover trials (n=236), 3 parallel-group trials (n=94), one open study (n=15) and one retrospective chart review (n=40).

Most of the included studies were considered to be of a poor quality on the basis of small size, short duration, brevity of washout periods and failure to use consistent assessment tools.

Six controlled trials (4 crossover design) of methylphenidate reported conflicting results.

Four controlled and one uncontrolled study indicated that amphetamines were effective, but the number of participants was small.

Data on pemoline were available from one crossover comparison with placebo and a retrospective chart review. In the trial (n=27), significantly more patients reached the primary response criterion on pemoline. The response rate in the chart review (n=40) was 70%.

Adverse effects were summarised by individual study.

Authors' conclusions
Stimulants may be effective for adult ADHD but more data are needed to confirm long-term efficacy. The author also suggested that pemoline may be less effective than methylphenidate and amphetamines.

CRD commentary
The review question was seemingly clear, but the inclusion criteria were not reported in much detail. The search for studies was limited. The author did not report taking steps to minimise reviewer bias when selecting studies for inclusion in the review. The included studies were all published as journal articles; neither the outcome of contacting drug manufacturers or the likelihood of publication bias were mentioned. The characteristics of the included studies were well reported and a narrative synthesis was appropriate. The author evidently did assess study quality, although no method was reported, and took this into account in the conclusions. The evidence presented is consistent with the author's main conclusion, but is not sufficient to reliably compare the different types of stimulant.

Implications of the review for practice and research
Practice: The author stated that there is uncertainty about the effectiveness of stimulants in the treatment of adults with ADHD.

Research: The author stated that further research is a priority and that data are needed to confirm whether adults develop tolerance.

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