Albendazole versus praziquantel in the treatment of neurocysticercosis: a meta-analysis of comparative trials
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CRD summary
This review concluded that albendazole was more effective than praziquantel for clinically important outcomes in the treatment of neurocysticercosis, but more comparative interventional studies were required to draw a safe conclusion about the best regimen. The conclusions should be interpreted with extreme caution due to possible publication bias and failure to consider study quality or investigate heterogeneity.

Authors' objectives
To compare the effectiveness and safety of albendazole and praziquantel for the treatment of neurocysticercosis.

Searching
PubMed and Cochrane Central Register of Controlled Trials (CENTRAL) were searched (search dates not reported). The search included all languages, but only studies published in English, French, German and Italian were evaluated. Search terms were reported. Reference lists were examined for additional studies.

Study selection
Prospective trials that compared albendazole with praziquantel in patients with neurocysticercosis infected with parasites in their cystic stage without perilesional inflammation were eligible for inclusion if they examined the partial or total disappearance of cysts and/or control of seizures. Studies using concomitant drugs were eligible for inclusion. The included studies were conducted in Mexico and Ecuador. Studies were mainly of parenchymal neurocysticercosis with varying levels of inflammation and cysts. Doses of albendazole ranged from 15mg/kg/day to 20mg/kg/day and praziquantel from 50mg/kg/day for varying lengths of treatment duration. Concomitant therapy consisted of at least antiepileptic drugs plus one or more of the following in the included studies: corticosteroids, analgesics, antiemetics and symptomatic medication. Follow-up ranged from three to 18 months. The primary outcome was the proportion of patients with controlled seizures. Secondary outcomes were reduction of cysts, total disappearance of cysts, adverse events related to the antihelminthic drugs and the side-effect intracranial hypertension.

Studies were selected independently by two reviewers. Disagreements were resolved by consensus among all reviewers.

Assessment of study quality
Randomised controlled trials (RCTs) were assessed for quality using the Jadad scale in terms of randomisation, blinding, withdrawals and allocation to produce a quality score out of 5. Other study designs were not assessed for quality. The reviewers (number not reported) independently assessed validity and disagreements were resolved by consensus amongst all reviewers.

Data extraction
Data were extracted for the outcomes control of seizures, reduction of cysts, total disappearance of cysts, mortality, total adverse events and intracranial hypertension. Odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were calculated. The authors did not state how the data were extracted.

Methods of synthesis
Odds ratios were pooled using the Mantel-Haenszel fixed-effect model and DerSimonian and Laird random-effects model and corresponding 95% CIs calculated. Results of the fixed-effects model were presented only when no statistically significant heterogeneity was present. For the outcome reduction of cysts a linear regression model was used to calculate a beta coefficient and corresponding 95% CIs. For analyses of seizure control, logarithms of rate ratios were combined with the inverse variance method. Statistical heterogeneity was assessed using the $I^2$ test and $X^2$ test. Publication bias was assessed with a funnel plot.
Results of the review
Six studies were included in the review (n=404): two RCTs (n=225) and four prospective studies (n=179). Both RCTs had a Jadad score of 3.

Albendazole was associated with significantly better control of seizures than praziquantel (OR 4.94, 95% CI 2.45 to 9.98, p<0.00001; one RCT and three prospective studies, n=156) and total disappearance of cysts (OR 2.30, 95% CI 1.06 to 5.00, p=0.03; six studies, n=335) than praziquantel. There was strong evidence of statistical heterogeneity for both analyses (I²=51.2% and 50.3%, X² p=0.07).

There was no significant difference between drugs for reduction of cysts, adverse events or intracranial hypertension. The authors reported that mortality data was inadequate to allow meaningful analysis.

Authors’ conclusions
Albendazole was found to be more effective than praziquantel for clinically important outcomes. However, more comparative interventional studies were required to draw a safe conclusion about the best regimen.

CRD commentary
The research question was supported by clear inclusion criteria for patients, intervention, outcomes and study design. Only studies published in English, French, German or Italian were evaluable, which increased the possibility of language bias. The search included only published studies, so it was possible that relevant studies were missed. The results of the funnel plot were not reported. The processes of study selection and validity assessment were performed in duplicate, which reduced possible reviewer error and bias; whether any similar steps were taken for data extraction was unknown. Only the methodological quality of the RCTs was assessed, so it was unknown whether the remaining studies were robust and whether the results and pooling of data were reliable. Study quality did not appear to be considered in the analysis. Statistical heterogeneity was assessed. Even when it appeared that there were significant statistical differences between studies, heterogeneity was not fully investigated; this was particularly problematic since a variety of study designs were included. The primary studies also appeared to be clinically heterogeneous. The authors’ conclusions should be interpreted with extreme caution due to the possibility of publication bias and failure to consider study quality in the analysis or investigate heterogeneity.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that more studies, in particular RCTs with homogeneous regimens and longer follow-up periods, were required.

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