Introduction: Despite almost two decades of modelling Alzheimer's disease (AD) in transgenic mice there remain significant challenges in translating efficacy from animal studies to clinical trial. Here we seek to improve our understanding of the causes of translational failure.

Aims:

(1) To use systematic review and meta-analysis to describe the use of transgenic mouse models of AD, and

(2) to examine the impact of study quality and study design features on outcome.

Methods:

(1) Electronic searching of three online databases was used to identify publications reporting the use of interventions in transgenic models of AD.

(2) Outcome was measured as behavioural and histological end-points. We used DerSimonian and Laird random effects meta-analysis. The impact of aspects of study quality and study design features was assessed using stratified meta-analysis.

Results: 409 publications were identified using 53 different transgenic models and 328 different interventions. Study quality was low; 14% of papers report random allocation to group. 22% report blinded assessment of outcome that was associated with more conservative estimates of effect size. Efficacy was higher with earlier times of administration.

Discussion: These data suggest early intervention may be crucial to positive therapeutic outcome. However, study quality was low and has been reported in the preclinical data of other neurological disorders to be a potential source of bias. Although these data must be interpreted with caution, it seems plausible that early diagnosis and treatment may be fundamental to improving the translation hit of AD therapy.