Acute and maintenance effects of non-pharmacologic interventions for antipsychotic associated weight gain and metabolic abnormalities: a meta-analytic comparison of randomized controlled trials

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CRD summary
The authors concluded that behavioural interventions (cognitive-behavioural therapy or nutrition and/or exercise interventions) effectively reduced weight gain associated with use of antipsychotic medication. The reliability of the authors' conclusions is uncertain due to a lack of study quality assessment, limits in the description of interventions and short follow-up times.

Authors' objectives
To evaluate the effectiveness of non-pharmacological (behavioural) interventions for weight gain associated with antipsychotic use.

Searching
PsycINFO, MEDLINE, PubMed, CINAHL and The Cochrane Library were searched for relevant studies (date of latest search not given). Search terms were reported. Reference lists of relevant articles were searched.

Study selection
Studies were eligible if they were randomised controlled trials of non-pharmacological interventions aiming to prevent or reduce weight gain associated with use of antipsychotic medication. Outcomes to be assessed included weight, body mass index (BMI), waist circumference, percentage body fat, cholesterol (total, high density lipoprotein, low density lipoprotein), triglycerides, fasting glucose, insulin, systolic blood pressure and discontinuation of treatment.

Participants were aged between 26 and 55 years. Between 30% and 79% (mean just over 50%) of participants were male. Baseline BMI was around 29kg/m². Most of the patients had schizophrenia or schizoaffective or schizophreniform disorder. Intervention durations were between eight and 72 weeks. A small number of studies had postintervention follow-up periods of between eight and 52 weeks. Interventions included cognitive-behavioural therapy and nutritional and/or exercise programmes (no further details given). The included studies were published between 2005 and 2011.

The authors did not state how many reviewers selected studies for inclusion.

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

Data extraction
Data were extracted by one author and checked by a second. Inconsistencies were resolved by discussion. Continuous outcomes were expressed as weighted mean differences with 95% confidence intervals. Dichotomous outcomes were expressed as risk ratios with 95% confidence intervals.

Methods of synthesis
A meta-analysis was carried out using a random-effects model. The number needed to treat was calculated. Heterogeneity was assessed using the $I^2$ statistic ($I^2>50\%$ defined as significant heterogeneity).

Subgroup analyses were carried out based on type of intervention (cognitive-behavioural therapy versus diet and/or exercise), trial duration (three months of less versus more than three months), prevention versus treatment trials, individual versus group interventions and in-patient versus mixed or outpatient status. Small study bias was evaluated using funnel plots.

Results of the review
The review included 17 randomised controlled trials (810 participants).

Non-pharmacological interventions resulted in a significant weight change of -3.12kg (95% CI -4.03 to -2.21; 14 studies, no significant heterogeneity) and a significant change of BMI of -0.94kg/m² (95% CI -1.45 to -0.43; 16 studies, significant heterogeneity) compared to control. In both cases, changes were similar for prevention and treatment trials. Where reported, there were also significant reductions in waist circumference, percentage body fat and proportion of participants who gained 7% or more of weight.

Where reported, the intervention groups also showed significant reductions in insulin levels, fasting glucose, total cholesterol, low density lipoprotein cholesterol and triglycerides compared to control. There were no significant differences seen in high density lipoprotein cholesterol, systolic blood pressure and all-cause discontinuation rates.

There was substantial heterogeneity in many of the analyses.

Subgroup analyses: The authors reported a larger effect on weight and BMI for outpatient populations than for in-patient or mixed populations and also for nutrition and/or exercise interventions than for cognitive-behavioural interventions but did not report whether differences were statistically significant. No significant differences were seen for the other subgroup analyses carried out. Results for maintenance of weight or BMI loss after the end of the interventions were mixed (significant for studies that reported weight loss but not for studies that reported BMI after an average of 3.6 months’ follow-up).

The authors found no evidence of small study bias (funnel plot evaluation).

Authors’ conclusions
Behavioural interventions, including cognitive-behavioural therapy and nutrition and/or exercise interventions, effectively reduced weight gain associated with use of antipsychotic medication, especially in outpatients who agreed to participate in trials that aimed to improve physical health.

CRD commentary
The review question and inclusion criteria were clear. Various relevant sources were searched. No indications of search dates and restrictions were given, so it was unclear how complete or up-to-date the search was. Reference lists were searched. Methods of study selection were not reported, so any steps taken to reduce error and bias were unclear.

All included studies were randomised controlled trials. Study quality was not reported, so it was unclear how reliable the studies were. Study details were provided but only very limited information was given on the behavioural interventions (which are expected to differ substantially, even in any one category). Some heterogeneity was seen but this was not commented on further. Statistical significance values for the comparison of subgroups were not given. There were mixed results for long term follow-up of studies that reported weight or BMI and the average follow-up periods were short, so long term effectiveness of the interventions was uncertain.

The reliability of the authors’ conclusions is uncertain due to a lack of study quality assessment, limits in the description of interventions and short follow-up times.

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

Research: The authors stated a need for future studies of behavioural interventions for prevention of weight gain in this population. Studies should include larger samples, longer follow-up periods and assess a range of cardio-metabolic risk markers as well as psychiatric outcomes. Studies in high risk populations (such as adolescents or first episode patients) were needed as were motivational factors for participation in a behavioural weight management programmes and comparisons with pharmacological interventions.

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