

RESEARCH ARTICLE

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Metformin in prevention and treatment of antipsychotic induced weight gain: a systematic review and meta-analysis

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Abstract

Background: Most antipsychotics are associated with weight gain and other metabolic complications. Several randomized trials have shown metformin to be effective, but this still hasn't been included in clinical guidelines on managing antipsychotic induced weight gain.

Methods: All double blind placebo controlled trials assessing the efficacy of metformin in the treatment of antipsychotic induced weight gain were included. Cochrane Central Register of Controlled Trials (CENTRAL) and MEDLINE were searched for the period January 2000-December 2015. Meta-analysis was carried out using the random effects model.

Results: Meta analysis of 12 published studies with a total of 743 patients found that in patients treated with antipsychotics, metformin treatment resulted in significantly better anthropometric and metabolic parameters than placebo. The mean change in weight was -3.27 kg (95 % CI -4.66 to -1.89) ($Z = 4.64$, $p < 0.001$). Metformin compared to placebo resulted in significant reduction in BMI [-1.13 kg/m² (95 % CI -1.61 to -0.66)] and insulin resistance index [-1.49 (95 % CI -2.40 to -0.59)] but not fasting blood sugar [-2.48 mg/dl (95 % CI -5.54 to 0.57).

Conclusion: This meta-analysis confirms that metformin is effective in treating antipsychotic induced weight gain in patients with schizophrenia or schizoaffective disorder.

Background

Most antipsychotics are associated with weight gain and other metabolic complications [1]. Prevalence of metabolic syndrome is higher in patients treated with antipsychotics than in drug naive patients with schizophrenia. Metabolic syndrome is more likely with second generation antipsychotics than first generation antipsychotics [2]. Rate of weight gain is highest in the first six months after commencing treatment however patients continue to gain weight during the course of treatment [3]. Clozapine and olanzapine have the highest risk of weight gain while aripiprazole, lurasidone and ziprasidone have the lowest risk [4–6].

The standardized mortality ratio in schizophrenia is 1.5 times that of the general population [7]. This risk

has been increasing over the recent past [8]. Some of this increased risk is attributed to the use of second generation antipsychotics [9]. Coronary heart disease is the major cause of death in patients with schizophrenia. Increased rates of cigarette smoking, obesity and metabolic syndrome caused by life style factors and side effects are major contributors [10]. The beneficial effects of better compliance with medication and reduced suicide rates due to second generation antipsychotics are offset by the deaths due to antipsychotic induced weight gain [9].

Behavioural interventions consisting of life style modifications are effective in reducing antipsychotic induced weight gain [11]. These can be used alone or as an adjunctive to pharmacological treatment. There is no significant difference between the types of interventions of individual or group therapy and nutritional counselling and cognitive behaviour therapy [11].

Metformin enhances the action of insulin in the liver and thereby decreases the rate of hepatic glucose production

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