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Review article

Prevalence and determinants of metabolic syndrome in patients with schizophrenia: A systematic review and meta-analysis of Indian studies

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ABSTRACT

Introduction: Several authors have studied prevalence of metabolic syndrome (Met-S) in schizophrenia patients. Studies conducted in Indian scenario have shown conflicting results. Community based studies reported extremely low prevalence of metabolic syndrome in contrast to hospital based studies reporting higher rates. In this systematic review we summarize results of studies conducted in India and discuss possible reasons for these discrepancies.

Methods: Literature search was conducted with keywords metabolic, schizophrenia and India in PubMed, Google Scholar, and Science Direct database. Studies assessing prevalence of metabolic syndrome using IDF or NCEP-ATP III criteria, conducted in hospital and community setting were included.

Results: Fourteen studies conducted in hospital setting and two studies conducted in community were included for analysis. Pooled prevalence of Met-S in patients with schizophrenia was 29.83%. Pooled prevalence in community based studies was 10.81% significantly lower than in hospital based studies 33.05%. Overall meta-analysis of studies with case control design showed an OR 3.03 for prevalence in cases compared to controls. Except in one study conducted in a rural community, all other studies reported higher prevalence of Met-S in schizophrenia patients compared to controls. Drug-naïve patients had a pooled prevalence of 11.86%.

Conclusion: In India, prevalence rates of Met-S in schizophrenia patients are comparable to the rates reported in western studies. Community based studies highlight a significantly lower prevalence compared to hospital studies. More community based studies will enhance our understanding of prevalence and determinants of Met-S in patients with schizophrenia.

Contents

Abbreviations: Met-S, metabolic syndrome; NCEP-ATP, National Cholesterol Education Program-Adult Treatment Panel; IDF, International Diabetic Federation.

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1. Introduction

Life expectancy of schizophrenia patients is lower than that of the general population and the gap is increasing over the time (Brown, 1997). The increased rates of mortality cannot be explained only by increased rates of unnatural causes of death like suicide/accident (Brown et al., 2000). Cardiovascular and cerebrovascular morbidity is disproportionately higher among schizophrenia patients than general population and thus can explain substantial proportion of excessive mortality (Lahti et al., 2012).

Patients with schizophrenia are known to have higher occurrence of risk factors for cardiovascular and cerebrovascular events even before the prescription of antipsychotics (Verma et al., 2013; Ryan et al., 2003). Higher fasting blood sugar and higher insulin resistance are known in patients who were never exposed to antipsychotics (Ryan et al., 2003). Antipsychotic treatment itself further increases the emergence of risk factors such as metabolic derangement, obesity and weight gain (De Hert et al., 2008; Meyer et al., 2008).

Not all patients exposed to typical and atypical antipsychotic have increased occurrence of these risk factors. While wide variations have been reported little is known about the factors underlying this variation and the importance of understanding them cannot be overemphasized. Variation in genetic makeup, dietary pattern, physical exercise and substance abuse as co-morbidity may be largely responsible for this. Considering great heterogeneity in these factors between populations inhabiting to different geographies, studies done in other parts of the world may not be directly extrapolated to our population. It is heartening to note that substantial work has been done in recent years in this regard in India.

In this paper we have conducted systematic review and meta-analysis of the studies on metabolic abnormality in patients with schizophrenia in India.

2. Methods

The study was carried out in accordance to PRISMA statement for systematic reviews and meta-analysis (Moher et al., 2009). Fig. 1 represents the flow diagram adopted from PRISMA statement and the reporting checklist was utilized during the conduction and presentation of this study.

2.1. Search

Literature search was carried out by two authors independently (AHA and SG), in PubMed, Google Scholar, and Science Direct databases for studies on prevalence of metabolic syndrome in schizophrenia in India, published between 1950 and 1st September 2015. Following search phrases were used (1) metabol* AND (schizo* OR psycho*) AND (India [ad] OR India OR Indian); (2) Metabolic [All] AND India [All] AND Schizophrenia [All]. Further cross referencing was done by hand searching references of relevant articles to add additional literature.

2.2. Inclusion and exclusion criteria

The following inclusion criteria were applied for selecting a study for the review: (1) Study conducted in India. (2) Diagnosis of schizophrenia as established by ICD 10 or DSM IV criteria. (3) Studies which assessed prevalence of metabolic syndrome using NCEP ATP III or IDF criteria.

Exclusion criteria were as follows: (1) Studies which focused only on treatment of metabolic syndrome in population without reference to prevalence at baseline. (2) Studies which reported only a few of the metabolic parameters. (3) Studies with mixed population of other psychiatric disorders without schizophrenia specific prevalence reported.

Out of the 1110 articles screened after removal of duplicates 1070 of them were excluded from the review and analysis. Most common reasons for exclusion were (a) studies conducted in non-Indian population; (b) studies not utilizing NECP-ATP III and IDF criteria for diagnosis of metabolic syndrome; (c) studies not determining the prevalence of metabolic syndrome but only determining a few metabolic parameters. Age, sample size, prevalence of Met-S, medication status, predictors of Met-S data was extracted when available from relevant studies.

Prevalence of metabolic syndrome in patients in community and hospital setting was the primary statistic reviewed. Influence of age, weight, medication status, type of medication was reviewed as secondary measure. Prevalence of metabolic syndrome was compared between cases and healthy controls from available data from six studies. In studies with follow up design baseline prevalence of Met-S was used for analysis.

2.3. Statistical tests

Calculation of pooled prevalence and their 95% confidence intervals, and comparison of proportions were carried out using statistical software R; package STATS (R Core Team, 2015). Meta-analysis of selected studies with case control design was carried out using R based meta-analysis application Openmetaanalyst (Wallace et al., 2012). In view of the small number of studies utilized for meta-analysis I^2 (inconsistency) among studies was calculated and estimated to be 64.5% indicating substantial heterogeneity. DerSimonian Liard random effects proportion meta-analysis was used to analyze the pooled data from studies of case control design.

3. Results

Fourteen studies conducted in hospital setting and two studies conducted in community setting met inclusion criteria. Six studies