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Review

The obsessive compulsive spectrum in schizophrenia, a meta-analysis and meta-regression exploring prevalence rates

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ABSTRACT

Aims: The aims of this study were to conduct a meta-analysis and meta-regression to estimate the prevalence rates for obsessive compulsive symptoms (OCS) and obsessive compulsive disorder (OCD) in schizophrenia, and to investigate what influences these prevalence rates.
Method: Studies were identified via an online OVID database search, including PsychInfo, Embase and Medline until December 2009.
Results: Forty-three studies summarizing outcomes for 3978 subjects met inclusion criteria. The mean OCD prevalence is 12.3%, slightly increasing to 13.6% after adjustment in meta-regression. The prevalence rate of OCS, defined as any obsession or compulsion is 30.7% (30.3% adjusted). Higher severity of OCS, DIGS assessment, and Sub-Saharan African origin of study are associated with a lower OCS/OCD prevalence rate, use of DSM-IV edition, Y-BOCS assessment and longer schizophrenia history are associated with a higher prevalence rate.
Conclusion: The prevalence of OCS and OCD in schizophrenia is substantial, specifically in more chronic patient populations and is influenced by the method of assessment.

1. Introduction

After modifying the diagnostic hierarchical DSM-rules that excluded co-morbid conditions in schizophrenia with the introduction of DSM-IIIR in 1987, the remarkably high co-occurrence of obsessive compulsive spectrum disorders in schizophrenia has resulted in a growing interest in the topic. Co-morbidity of schizophrenia and obsessive compulsive symptoms (OCS) or obsessive compulsive disorder (OCD) has clinical implications, as this type of co-morbidity is associated with greater dysfunction, poorer quality of life, more suicide attempts and a smaller social network (Lysaker and Whitney, 2009). Most studies also report an association between co-morbid OCS and higher levels of positive, negative and depressive symptoms, although a meta-analysis found this association in OCS and not in OCD (Cunill et al., 2009). Adequate recognition of OCS in schizophrenia is of great clinical importance. OCS is a condition causing additional suffering but may respond well to treatment. Research suggests that successful treatment of OCS with, for instance, serotonergic antidepressants leads to a significant reduction of psychotic symptoms as well (Reznik and Sirota, 2000).

Reported prevalence rates however show a striking variation. OCS, defined as the presence of obsessions and compulsion not severe enough to meet the diagnostic criteria of OCD may occur as high as in 64% (Kayahan et al., 2005) of patients with schizophrenia. Reported OCD co-morbidity ranges between 0% and 59% across studies (Bland et al., 1987; Fabisch et al., 2001). Overall, these prevalence rates are much higher than in the general population where the lifetime prevalence for OCD is 1.6% (Kessler et al., 2005a). Interestingly, even though patients with schizophrenia often have co-morbid conditions(Buckley et al., 2009), the difference between the prevalence of OCS in schizophrenia patients and the community is much more pronounced than with other anxiety disorders and depression(Bijl et al., 1998; Achim et al., 2011). The reason for this high co-occurrence of OCS in schizophrenia is still not fully understood. A number of factors are potentially associated with the prevalence estimate of OCD/OCS in schizophrenia. These include measurement issues such as the instruments and diagnostic thresholds used to define OCS and OCD, sampling methods, as

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well as patient characteristics such as age, gender, cultural background, severity and chronicity of psychotic disorder, and treatment setting. The importance of these factors is shown by the fact that two earlier reviews that addressed the issue of anxiety disorders in schizophrenia found substantially differing figures. Buckley et al. (Buckley et al., 2009) calculated a weighted average from 36 studies providing prevalence rates and estimated the prevalence of OCS to be 25% and OCD to be 23%. Achim et al. (2011) also performed a meta-analysis of all anxiety disorders in schizophrenia but found a mean prevalence of 12.1% for OCD and provided no information on OCS.

The current study will focus specifically on the whole OCS spectrum, including OCS prevalence rates at specific Y-BOCS cut-off points. It aims to provide a best estimate of both OCS and OCD prevalence in schizophrenia patients. Second, this study intends to identify the variables associated with a higher OCS/OCD prevalence rate through meta-regression analysis.

2. Method

2.1. Literature search and study selection and data retrieval

Studies were selected by performing an online OVID database search, including PsychInfo, Embase and Medline up to December 2009. The following keywords were used: "psychosis or schizophrenia", "obsessive compulsive". All potentially relevant articles were screened manually by title and, if necessary, by abstract. All reviews and relevant articles were checked for references. All articles reporting on the prevalence of OCS/OCD in patients with schizophrenia spectrum disorder were assessed by two authors independently (MS, JD) in order to ascertain eligibility. Inclusion criteria were studies 1) published in English or French; 2) focusing on schizophrenia spectrum disorders (schizophrenia, schizo-affective disorder, schizophreniform disorder, delusional disorder or psychosis NAO); and 3) using standardized criteria of the diagnosis OCD or OCS through direct patient interview. Exclusion criteria were 1) retrospective designs; 2) studies using the Diagnostic Interview Schedule (DIS). The reason for not including these studies is that the DIS, and its successor the CIDI, used in community surveys by lay interviewers is associated with a slight under-diagnosis of schizophrenia(Bland et al., 1987) and a considerable over-diagnosis of OCD, up to fivefold (Stein et al., 1997); 3) insufficient data on sample variables to define an OCD or OCS subsample or insufficient data to identify a schizophrenia spectrum patient sample; 4) studies reporting the same or overlapping data; 5) studies focusing on "childhood schizophrenia"; and 6) studies using selection criteria likely to influence OCS/OCD prevalence rates and which could not be corrected for in meta-regression, such as all patients using clozapine.

In cases of missing data or queries about the data, information from articles on the same data were used. If necessary authors were contacted.

2.2. Methodological categorization

In our OCD category we included all selected studies using a clinical OCD diagnosis, the Structured Clinical Interview for DSM (SCID), the Anxiety Disorder Interview Schedule (ADIS), or the Diagnostic Interview for Genetic Studies (DIGS) as diagnostic instrument and studies using a Y-BOCS cut-off of 16/17 points. The Y-BOCS is not a diagnostic instrument but, after giving a definition and examples of obsessions and compulsions, it assesses the severity of OCS. The 16 point cut-off is a standard inclusion criterion for OCD treatment studies, equalling at least moderate severity (Antony et al., 2001; Öngur and Goff, 2005). Lysaker et al., in order to find a Y-BOCS cut-off representative of OCD, subtracted the average standard deviation of recent OCD studies from the average mean Y-BOCS score, resulting in a cut-off of 17 (Lysaker et al., 2002). Of longitudinal studies only the first assessment data were used.

In our OCS-category, we included all studies without and one study with a very low threshold (Y-BOCS ≤ 4) to define OCS.

In order to determine whether and how differences in OCS thresholds affected prevalence estimates, we distinguished four subcategories of studies using similar Y-BOCS cut-off scores, namely scores 1–5, 6–9, 10–13 and 14–17. Studies were assigned to a category based upon the minimum Y-BOCS-score used for inclusion. When no cut-off scores were provided the minimum Y-BOCS score was used. Thus studies in the subcategory 1–5 included subjects with a minimum Y-BOCS score between 1 and 5 and all subjects with scores above the cut-off. Several studies provided data fitting more than one category and subsequently were assigned to several categories.

2.3. Data extraction

The following data were extracted from the included studies: sample size, diagnostic procedure and classification of schizophrenia spectrum disorder and OCS/OCD, assessment instruments and cut-offs used to define OCS status and disease severity, present state or lifetime diagnosis, duration of psychotic illness, percentage of OCS/OCD patients in the sample, recruitment method, treatment setting and socio-demographic characteristics such as mean age, gender distribution and ethnic background.

2.4. Data analyses

The statistical procedures used to conduct this meta-analysis include inverse-variance weighted effect sizes (Lipsey and Wilson, 2001) to account for differences in sample sizes, taking into consideration that studies with larger sample sizes will yield more accurate estimates of the population parameters than studies with smaller sample sizes. For analysis purposes, the outcome proportions were transformed to logits (Lipsey and Wilson, 2001). When the outcome proportions equalled 0% or 100%, 0.5 was added to both cells (containing frequencies of events and non-events) before applying the logit transformation. Data on this outcome measure were analysed using Comprehensive Meta-analysis software Version 2. We defined studies as outliers if the effect sizes and the 95% confidence intervals did not overlap with the 95% confidence interval rates of the pooled effect size of all studies combined. The impact of the outliers was addressed using a sensitivity analysis. To evaluate a possible significant effect on the pooled prevalence estimate, the group of outliers was added to the meta-regression analysis as potential confounders.

Before combining studies in the meta-analysis, we evaluated the presence and possible causes of heterogeneity (Q-test) in the outcomes of the OCS and OCD category. Heterogeneity was also assessed by the I^2 metric, i.e. the percentage of between-study variance due to systematic heterogeneity rather than chance (Higgins et al., 2003). Where there was significant heterogeneity, random-effects methods were used in pooled analyses.

Sensitivity analyses included assessment of the influence of each study on the overall estimates of OCD/OCS prevalence by recalculating the pooled outcome proportions with one study removed and all others included.

In addition, heterogeneity was further explored using a series of meta-regression analyses, in which we evaluated the effect of methodological variables, demographic variables, illness-related characteristics and outliers on the prevalence of OCS/OCD in patients with schizophrenia. These meta-regression analyses were performed using SPSS 17 software with macros provided by Lipsey and Wilson (2001).

The following a priori defined variables that may be related to OCS/OCD prevalence estimates were used for meta-regression.

2.4.1. Method of OCD-assessment

Instruments: roughly three ways of assessing the OCS/OCD diagnosis were applied; the DIGS, which addresses OCS relatively superficially, the SCID and ADIS, which use a more thorough set of questions and finally instruments specifically addressing OCS, the Y-BOCS and the OCI, most