Journal of Psychiatric Research 69 (2015) 19–26

Contents lists available at ScienceDirect

Journal of Psychiatric Research

journal homepage: www.elsevier.com/locate/psychires

The association between psychosis and severe pain in community-dwelling adults: Findings from 44 low- and middle-income countries

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ARTICLE INFO

Article history:
Received 6 May 2015
Received in revised form
12 July 2015
Accepted 17 July 2015

Keywords:
Low-income countries
Middle-income countries
Pain
Psychotic symptoms
Schizophrenia

ABSTRACT

Previous studies examining the association between schizophrenia and pain have produced mixed results and data on sub-threshold psychosis or psychotic symptoms and pain are scarce. This study assessed the association between psychosis and severe pain among community-dwelling adults in 44 low- and middle-income countries (LMICs) where no data exists.

Data on 235,370 adults aged ≥18 years from the World Health Survey (WHS) 2002–2004 were analyzed. The presence of past 12-month psychotic symptoms was established using four questions from the Composite International Diagnostic Interview. Participants were categorized into four mutually exclusive groups based on whether they had at least one psychotic symptom and/or a lifetime psychosis or schizophrenia diagnosis. Multivariable logistic regression was used to estimate the association between psychosis and past 30-day severe pain. The prevalence of severe pain among those with 0, 1, 2, ≥3 psychotic symptoms was 8.7%, 16.7%, 21.8%, 30.5% respectively. Compared to those with no psychotic symptoms or diagnosis, the ORs (95%CIs) were: at least one symptom without diagnosis [2.17 (1.99–2.38)]; no symptom with diagnosis [2.33 (1.71–3.17)]; at least one symptom and diagnosis [4.27 (3.20–5.71)]. Associations were partly mediated by chronic physical conditions, anxiety, and depression. Despite some limitations such as the use of a single-item question to assess pain, the results of this study suggest that individuals with psychotic symptoms or a psychosis diagnosis should be systematically assessed for pain, and if necessary, receive treatment for pain and its underlying conditions. Future research on the effect of pain management on psychosis outcome is warranted.

1. Introduction

Schizophrenia is a severe mental disorder characterized by delusions and hallucinations and is associated with a shorter life-expectancy by more than 20 years compared to that in the general population (Tiihonen et al., 2009). The reported major contributors to this higher mortality are unhealthy lifestyles (e.g., inadequate diet, smoking, and alcohol consumption), medical comorbidities such as cardiovascular diseases, adverse effects of antipsychotic drugs, and unequal access to health care (Laursen et al., 2012). Psychotic-like experiences are often considered as part of extended phenotypes of psychotic disorders which may exist on a continuum of severity with its extreme end consisting of diagnosable psychotic disorders such as schizophrenia, although whether a dichotomy exists between schizophrenia and other attenuated forms of psychosis, or whether there is a continuum between the two is still a subject of debate (van Os and Kapur, 2009). However, it is also known that only a minority of those with subclinical psychotic symptoms progress to full-fledged psychosis (van Os et al., 2009).

Recently, there has been a growing interest in understanding and reducing the burden of physical health comorbidities in people

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http://dx.doi.org/10.1016/j.jpsychires.2015.07.020
0022-3956/

with psychosis, but research regarding pain as a symptom is lacking. Previous case reports and experimental studies have shown that patients with schizophrenia may have reduced pain sensitivity based on the observation that some patients demonstrate little pain when having painful conditions such as perforated peptic ulcer, appendicitis, and myocardial infarction (Dworkin, 1994), or that they have a higher pain threshold under experimental conditions or for medical procedures such as a lumbar puncture (Stubbs et al., 2014). Available evidence suggests that this reduced reactivity may be due to difficulties in expressing pain rather than a reduction in pain perception (Bonnot et al., 2009). However, since patients with schizophrenia have a higher risk for painful physical conditions such as cardiovascular diseases (Bresee et al., 2010), dental problems (Morales-Chavez et al., 2014), and fracture (Stubbs et al., 2015), this may not necessarily translate into less reported clinical pain at the population-level.

It is currently unclear how the increased risk for painful medical comorbidities and difficulty in expressing pain may affect the overall prevalence of pain among patients with schizophrenia. Although there was heterogeneity between individual study results, a recent meta-analysis by Stubbs et al. showed that the overall prevalence of pain is similar among those with schizophrenia and their age- and sex-comparable comparison group despite the known higher risk for painful physical conditions associated with schizophrenia (Stubbs et al., 2014).

Even less is known about the association between sub-threshold psychosis or psychotic symptoms and pain. Although the prevalence of schizophrenia in the general population is known to be about 1%, data from the World Health Survey (WHS) showed that the overall global prevalence of at least one psychotic symptom was 12.5% with a figure as high as 45.8% being reported in Nepal (Nuevo et al., 2012). Previous studies have shown that psychotic symptoms are associated with decrements in health status (Nuevo et al., 2012), and that hospitalization not related to psychiatric causes and consumption of non-psychiatric drugs, as well as potentially painful conditions such as arthritis, angina, diabetes, tooth and mouth problems, and injuries are more common among those with psychotic symptoms compared to those with no such conditions (regardless of a psychosis diagnosis) (Moreno et al., 2013; Saha et al., 2011a). In addition, studies have also indicated that subclinical psychosis may be a non-specific marker of psychological distress (Saha et al., 2011b), which in turn, is strongly associated with the occurrence of pain (Johnson and Greenwood-Van Meerveld, 2014). This may mean that psychotic symptoms not reaching the threshold for a disorder may be highly prevalent in the population, and could be affecting population health either as a result of the symptoms themselves or through associated comorbidities.

The majority of previous studies on psychotic disorders and pain have been solely on schizophrenia, have had a small sample size, and been undertaken in high-income or Western settings, while most of the studies which have had a comparison group have used mixed clinical-community samples. Data on the association between psychotic symptoms or diagnosis and pain from population-based samples, especially from regions which have not been studied previously, are thus necessary. In particular, the association might differ in low- and middle-income countries (LMICs) due to suboptimal treatment of pain and/or psychotic disorders (Eaton et al., 2011; Goldberg and McGee, 2011). Defining the magnitude of the co-occurrence of psychosis and severe pain is important for the management of both pain and psychosis, especially as interventions to alleviate pain have been reported to lead to better mental health outcomes for other mental disorders (Haibach et al., 2014; Husebo et al., 2011; McCracken and Turk, 2002), and this might also hold true for psychotic disorders. However, to date, there have been no large-scale population-based studies on the association between psychotic symptoms or diagnosis and severe pain.

Thus, the aim of the current study was to assess the association between psychosis and pain using data from 44 LMICs where no data on this topic exists. We analyzed data from the WHS which was a population-based global survey that used a standardized questionnaire in 70 countries.

2. Methods

The WHS was a cross-sectional study carried out in 70 countries in 2002–2004. The goal of the study was to obtain population data on adult health and well-being that was globally comparable. Stratified multi-stage random cluster sampling was undertaken in 60 countries while in the remaining 10 countries, single-stage random sampling was performed. Survey details have been provided elsewhere (http://www.who.int/healthinfo/survey/en/). In brief, individuals who were aged 18 years old and above, and who had a valid home address were eligible to participate. Kish tables were used to select participants within households. Information was obtained through the use of standard questionnaires across the countries that had been back- and forward-translated with either a longer or shorter version being used depending on the country. Data were collected either by face-to-face interviews or by trained interviewers via telephone. Across all countries, the individual response rate was 98.5% (Nuevo et al., 2012). In order to account for differences in non-response across the countries, sample weights were generated in accordance with countries' population distribution as reported by the United Nations Statistical Division (Moussavi et al., 2007). Ethical boards at each study site provided approval for the study with informed consent being obtained from all participants after details of the procedure had been fully explained. The investigation was carried out in accordance with the latest version of the Declaration of Helsinki.

Data were publically available for 69 countries. With the exception of China, Comoros, the Republic of Congo, Ivory Coast, India, and Russia, these data are nationally-representative. Ten of the countries (Austria, Belgium, Denmark, Germany, Greece, Guatemala, Italy, Netherlands, Slovenia, and the UK) were excluded from the present study as sampling information was not available. Congo, Slovakia, and Swaziland were also omitted from the analysis as more than 25% of the data on pain was missing. The remaining 56 countries, which were divided into 10 high- ($n = 15,841$), 26 middle- ($n = 149,640$) and 20 low-income ($n = 102,211$) countries based on the 2003 classification made by the World Bank, were used in the calculation of the prevalence of severe pain ($n = 267,692$). High-income countries were included in this calculation to enable a global comparison of severe pain but were excluded from the analysis on the association between psychosis and pain as most countries did not collect information on psychotic symptoms or diagnosis and because the focus of this paper was on LMICs. Turkey and Morocco were also excluded from the analysis as there was no information on psychosis and anxiety respectively. Thus, 235,370 adults aged $\geq$18 years from 44 low- ($n = 102,211$) and middle-income ($n = 133,159$) countries were included in the analysis that assessed the association between psychosis and severe pain.

2.1. Severe pain

Pain was assessed by the question "Overall in the last 30 days, how much of bodily aches or pains did you have?" with answer options none, mild, moderate, severe, and extreme. Those who answered severe and extreme were categorized as having severe pain in this study. Severe pain was chosen as the cut-off for its potential clinical relevance.