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The relationship between paranoia and aggression in psychosis: A systematic review

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ABSTRACT

Aggression in the context of schizophrenia has significant detrimental personal, clinical and societal implications. Whilst understanding the precise pathways to aggression in people with a diagnosis of schizophrenia is critical for risk management and treatment, these pathways remain unclear. A paranoid belief that others intend harm is one psychotic symptom that might contribute to aggressive behaviours. This is the first review to investigate the relationship between paranoia and aggression in psychosis. A systematic review of published literature pertinent to the relationship between paranoia and aggression was conducted. A search of online databases from inception to November 2014 was performed with keywords related to 'schizophrenia', 'paranoia' and 'aggression'. Fifteen studies, primarily cross-sectional in design (n = 9), met eligibility criteria. Studies reviewed showed mixed support for an association between paranoia and aggression in both inpatients and community settings. However, when study quality was taken into account, more methodologically rigorous studies tended to show a positive association between factors. Mixed findings are most likely due to important methodological shortcomings, including heterogeneous samples and studies using a diverse range of aggression/violence measures. In light of methodological limitations of individual studies reviewed, further investigation of the relationship between paranoia and aggression in psychosis using robust methodology is needed before definitive clinical recommendations regarding the hypothesised relationship between paranoia and aggression can be made. This paper sets out key recommendations for future studies, including operationalizing the specific components of aggression and paranoia under investigation and methods to delineate important mediators in the paranoia and aggression relationship.

1. Introduction

There appears to be consensus that rates of violence are higher in people with a diagnosis of schizophrenia compared with the general population (Fazel et al., 2014) and other psychiatric groups (Arseneault et al., 2000; Walsh et al., 2004). For instance, meta-analytic studies have illustrated an average four-fold (males) and eight-fold (females) increase in violent crime for people with schizophrenia compared with the general population (Fazel et al., 2009). Whilst not all people with a diagnosis of schizophrenia are violent (Taylor, 2008), for those who are, violence and aggression are major contributors to poor treatment outcomes (White et al., 2006) and as such are detrimental to the well-being of those who receive a diagnosis, their families (Loughland et al., 2009) and society (Volavka and Citrome, 2008).

Violence and aggression are thought to exist on a continuum (Anderson and Huesmann, 2003). Aggression has been defined as behaviour that is intended to harm, that is directed towards other(s) and which the perpetrator believes the victim(s) would be motivated to avoid (Anderson and Bushman, 2002; Bushman and Anderson, 2001). Violence is aggression that has extreme harm as its goal (Anderson and Bushman, 2002). Given the elevated rates of violence and aggression and their subsequent detrimental impact on treatment outcome, it is essential to identify factors contributing to their occurrence. Violence and aggression in people with schizophrenia most often occur during periods of active (Appelbaum et al., 2000; Buckley et al., 2004) or untreated psychosis (Witt et al., 2013). Paranoia, inclusive of persecutory delusions, is a common symptom of schizophrenia (Savulich et al., 2015) and represents the unsubstantiated, yet intense and tenacious, belief that one is at threat of harm or persecution from others (Freeman and Garety, 2000). Paranoid individuals tend to generate other-blaming, externalising causal attributions for negative events (Bentall et al., 2001) and over-attribute threat to ambiguous stimuli (Pinkham et al., 2011) making it a pertinent symptom for consideration in understanding aggression. It is reasonable to hypothesise that frequent beliefs that others intend harm may contribute to the use of aggressive behaviour to remove a perceived threat (Bjørkly, 2002).

Whilst evidence exists reporting associations between paranoia and aggression, to date there is no published systematic review synthesising

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the relationship between these two factors whilst taking into account study quality. Accordingly, the aim of this review was to examine the relationship between paranoia and aggression in the context of schizophrenia, taking into account study quality, with a view to enhancing our understanding of the mechanisms through which some people with a diagnosis of schizophrenia are aggressive and violent. The dimensional nature of violence and aggression may explain why the terms are often used interchangeably in the literature and aspects of both are combined within many psychometric measures. To account for this overlap, both violence and aggression are examined within this review. Herein, the term aggression will be used, as all violence is aggression but not all aggression is violence.

2. Method

2.1. Eligibility criteria

Eligible studies were those published in peer-reviewed journals in the English language, using samples of people diagnosed with a non-affective psychotic disorder and using a validated scale of paranoia or an item measuring a component of paranoia from a validated psychiatric scale. A validated scale of paranoia was deemed necessary to ensure construct validity. A validated scale of aggression was not an inclusion criterion, as this would result in studies using conviction rates, for example, being deemed ineligible. Studies were included that examined the relationship between paranoia and aggression or differences in levels of paranoia between groups of aggressive and non-aggressive people with a diagnosis of schizophrenia. Qualitative studies, conference abstracts, dissertations and single case format articles were excluded.

2.2. Search strategy

The current review was conducted in accordance with the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) guidelines (Moher et al., 2009). An electronic database search of Ovid MEDLINE, PsycINFO, Embase, CINAHL, PubMed and Web of Science was conducted (from inception to November 2014). Three search sets of keywords were used which were linked with the instructions 'AND' and 'OR'. The search terms were: ("persecut*" OR "persecutory delusion*" OR "suspicion*" OR "paranoi*") AND ("violen*" OR "aggress*" OR "assault*" OR "anger" OR "angry" OR "hostil*" OR "temper" OR "rage" OR "offen*" OR "crim*" OR "danger*" OR "convict*") AND ("schizophrenia" OR "psychosis" OR "psychotic" OR "severe mental" OR "serious mental" OR "serious psychiatric"). Limits of 'peer-reviewed journals' and 'English language' were set. Reference lists of retrieved articles were also reviewed for additional relevant articles. Authors of relevant articles in which only positive symptom total scores were reported (e.g. positive symptom scale total of the Positive and Negative Syndrome Scale; PANSS, Kay et al., 1987) were contacted and data for specific paranoia items (e.g. item P6 'suspiciousness/persecution' of the PANSS) was requested.

2.3. Study selection and data extraction

The process of study selection and exclusion is summarised in Fig. 1. The initial search retrieved 4668 articles, which reduced to 2549 following the removal of duplicates using Endnote reference manager software. Of these, 2291 were excluded at the title stage for clearly not being consistent with the review topic. Next, article abstracts were screened for eligibility by the first author and an independent researcher, with a high level of agreement obtained ($\kappa = 0.89$). At this stage, any disagreements were resolved through discussion between the raters until agreement was reached about their inclusion/exclusion. The first author then screened 115 full-texts of the remaining articles and excluded a further 101 for not meeting at least one of the inclusion criteria described in Section 2.1. Five studies were identified following a review of the reference lists of included studies. Attempts to contact authors of potentially eligible studies for relevant data resulted in one additional study being included (Bucci et al., 2013). Fifteen studies met the full inclusion criteria and were discussed and agreed upon by the research team. For eligible studies, a data extraction sheet was developed to record: (1) study characteristics (study design, year of publication, country conducted); (2) sample demographics (sample size, diagnoses and study setting); (3) the measure of paranoia used; (4) the measure of aggression used; and (6) a summary of study findings.

3. Results

3.1. Overview of studies

Table 1 provides an overview of the studies reviewed. The predominant design was cross-sectional ($n = 10$), followed by prospective cohort studies ($n = 4$) and a retrospective cohort ($n = 1$) study. Studies were conducted in Europe ($n = 9$), United States of America ($n = 4$), Mexico ($n = 1$) and Australia ($n = 1$). There were seven different measures of paranoia used, of which the PANSS was the most common measure ($n = 11$). A variety of measures were used to assess aggression, including those that are self-reported (Bucci et al., 2013; Keers et al., 2014; Ringer and Lysaker, 2014; Swanson et al., 2006; Tsirigotis and Gruszczyński, 2013; Van Dongen et al., 2011), observer-rated (e.g. ward staff) (Arango et al., 1999; Calcedo-Barba and Calcedo-Ordonez, 1994; Cheung et al., 1997; Fresán et al., 2005; Krakowski et al., 1999; Nolan et al., 2005; Steinert et al., 2000; Van Dongen et al., 2012) or the use of official records (e.g. Police National Computer records; Bucci et al., 2013; Haddock et al., 2013; Keers et al., 2014).

3.2. Relationship between paranoia and aggression

3.2.1. Group comparison studies

When comparing aggressive and non-aggressive groups of inpatients with psychotic disorders, three studies found evidence of a relationship between paranoia and physical aggression (Arango et al., 1999; Cheung et al., 1997; Krakowski et al., 1999). Those in aggressive groups were more likely to report persecutory delusions ($\chi 2 = 9$. d. f. $= 1$, $p < 0.01$; Cheung et al., 1997) and greater levels of suspiciousness ($z = -2.34$, $p < 0.05$; Arango et al., 1999). Physically aggressive patients were more hostile/suspicious than non-physically aggressive patients ($p < 0.01$), whilst persistently physically aggressive patients were more hostile/suspicious than transiently physically aggressive ($p < 0.05$) and non-physically aggressive patients ($p < 0.01$; Krakowski et al., 1999). These studies were predominantly strong in quality; however, Krakowski et al. (1999) did not report if all participants completed the study. Two of the three studies (Arango et al., 1999; Krakowski et al., 1999) were prospective in design and therefore likely to have fewer sources of bias and confounding factors than retrospective studies, whilst also being more able to infer causality. All three studies controlled for confounders, such as substance use, antipsychotic medication dose, length of current admission, gender and age. Importantly, in one study aggressive patients were under-represented in the sample; there were sixteen participants in the aggressive group compared with forty-seven in the non-aggressive group (Arango et al., 1999). Nevertheless, a statistically significant difference was still found, despite the likely effect of unequal group sizes increasing type II error rates and hindering the obtainment of maximum power.

Both studies that found no difference between aggressive and non-aggressive inpatients in terms of paranoia (Calcedo-Barba and Calcedo-Ordonez, 1994; Nolan et al., 2005) were weak in quality. Specifically, no differences were found between aggressive and non-aggressive groups for mean BPRS suspicion scores ($p > 0.05$; Calcedo-Barba and Calcedo-Ordonez, 1994) or PANSS suspiciousness/persecution scores ($p > 0.05$; Nolan et al., 2005). These studies were cross-

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