BJPsych The British Journal of Psychiatry (2017)
210, 230–231. doi: 10.1192/bjp.bp.116.185249

Short report

Hallucinations in borderline personality disorder and common mental disorders

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Summary
Hallucinations are classically associated with psychotic disorders. Recent research, however, has highlighted that hallucinations frequently occur outside of the context of psychosis. Despite this, to our knowledge, there has been no epidemiological research to compare the prevalence of hallucinations across common mental disorders with the prevalence in borderline personality disorder (BPD). Using data from the Adult Psychiatric Morbidity Survey ($n = 7403$), we investigated the prevalence of hallucinations in individuals with a range of mental disorders and BPD. Hallucinations were prevalent in all disorders (range 11–24%). Hallucinations were no more prevalent in individuals with BPD (13.7%) than in individuals with a (non-psychotic) mental disorder (12.6%) ($\chi^2 = 0.03$, $P = 0.92$).

Declaration of interest
None.

There has been extensive epidemiological research on psychotic experiences in the population over the past decade.[1,2] These are hallucinations and delusions that occur across a spectrum of reality testing, on a continuum with the symptoms of psychotic disorder but not necessarily reaching a full psychotic level of intensity. Whereas initial research in this area focused on an associated increased risk for psychotic disorder, more recent research has demonstrated that hallucinations are also associated with a wide range of affective, anxiety and behavioural disorders.[3,4] In contrast to extensive epidemiological research on common mental disorders, there has been a lack of epidemiological research to date on hallucinations and personality disorders, aside from the obvious relationship with Cluster A personality disorders. It is, in particular, important to consider the relationship between hallucinations and borderline personality disorder (BPD), which was so named for the psychoanalytic construct of a disorder on the 'borderline' between neurosis and psychosis. The psychoanalytic 'borderline' concept has been superseded by an operationalised diagnosis in the DSM; however, psychotic experiences are still recognised as an important feature of BPD[5] and, among individuals presenting to clinic with BPD, prevalences of psychotic symptoms have been reported of between 20 and 50%.[5] One recent population-based study demonstrated a link between hallucinations/delusions and mood instability,[6] one of nine traits of BPD as defined in DSM-5. However, to our knowledge, there has been no research to date to look at the prevalence of BPD among individuals with hallucinations from either a categorical perspective (i.e. reaching full diagnostic criteria for BPD) or a continuum perspective (i.e. varying numbers of BPD traits not necessarily meeting full BPD criteria).

Using the 2007 Adult Psychiatric Morbidity Survey (APMS), a nationally representative study of mental health in England, we investigated the following: (a) the prevalence of hallucinations in individuals with BPD compared with individuals with a range of common mental disorders; (b) the prevalence of BPD among a community sample of individuals with hallucinations; (c) the correlation between BPD traits and hallucinations.

Method

Full details of the survey methodology are available in the study report.[7] In brief, a stratified, multistage probability sample of households in England was carried out in 2007 to recruit a nationally representative sample of participants aged 16 years and older. The Clinical Interview Schedule[8] was used by trained interviewers from the National Social Research Centre to assess for DSM-IV Axis-I disorders.[9] BPD traits were assessed using the structured interview for DSM disorders (SCID II) questionnaire.[10] In total, 7403 individuals took part in the study (response 57%). The study was approved by the Royal Free Hospital and Medical School Research Ethics Committee.

The Psychosis Screening Questionnaire[11] was used to assess for hallucinations. We previously showed that survey items on auditory and visual hallucinations demonstrated the best sensitivity and specificity not just for predicting hallucinations but for psychotic experiences in general (compared with clinical interview).[12] Therefore, the item in the study that we used was: 'Over the past year, have there been times when you heard or saw things that other people couldn't?'

Statistical analyses

Data were analysed using Stata (version 11.2 for Windows). We used logistic regression to examine the relationship between hallucinations and a diagnosis of each mental disorder or BPD. We used point biserial correlation to examine the relationship between hallucinations and number of BPD traits. Reported prevalences are weighted using the APMS study sampling weights to account for individual-level sampling factors of the study,[7] and analyses were adjusted for gender and socioeconomic status.

Results

The weighted prevalence of hallucinations in the population was 4.3% ($n = 323$). Women and men did not differ in hallucination prevalence ($\chi^2 = 0.95$, $P > 0.05$). The weighted prevalence of BPD in the population was 0.4% ($n = 16$). Three-quarters of individuals with BPD ($n = 12$) also had at least one mental disorder. Men and women did not differ in the prevalence of BPD ($\chi^2 = 4.16$, $P > 0.05$) but BPD traits were significantly more prevalent in women than in men ($t = 2.19$, $P = 0.029$).

The prevalence of current mental disorders among all individuals with hallucinations was 22%, compared with a prevalence of 7% in individuals who did not have hallucinations (odds ratio (OR) = 3.67, 95% CI 2.71–4.97). Specifically, among individuals with hallucinations, 10.7% had generalised anxiety disorder, 9.7% had depression, 6.5% had agoraphobia, 4.3% had obsessive–compulsive disorder, 4.1% had social phobia, 4% had panic disorder and 3.9% had a specific phobia. The prevalence

https://doi.org/10.1192/bjp.bp.116.185249 Published online by Cambridge University Press

Table 1 Prevalence and odds of hallucinations in individuals with mental disorders and borderline personality disorder[a]

Disorder	Prevalence of hallucinations *n* (%)	OR (95% CI)
Agoraphobia (*n* = 95)	25 (24.2)	6.91 (4.00–11.92)
Specific phobia (*n* = 76)	14 (17.9)	4.64 (2.29–9.42)
Social phobia (*n* = 86)	17 (17.7)	4.48 (2.42–8.30)
Obsessive compulsive disorder (*n* = 86)	17 (17.0)	4.37 (2.28–8.38)
Panic disorder (*n* = 83)	11 (15.6)	4.13 (2.04–8.36)
Depression (*n* = 255)	39 (14.2)	3.69 (2.47–5.53)
Borderline personality disorder (*n* = 16)	3 (13.7)	3.20 (0.69–14.80)
Generalised anxiety disorder (*n* = 363)	39 (10.5)	2.69 (1.81–4.01)

For each disorder the raw *n* is presented but the percentages are adjusted according to study sampling weights.
a. For purposes of odds ratio calculation, each individual disorder was compared with the total rest of population.

of BPD among all individuals with hallucinations was 1.3% (OR = 3.20, 95% CI 0.69–14.78).

The prevalence of hallucinations in individuals with mental disorders, by comparison, varied from a low of 10.5% (generalised anxiety disorder) to a high of 24.2% (agoraphobia) (Table 1). Overall, 12.6% of individuals with a mental disorder reported hallucinations, compared with 3.7% of individuals who did not have a mental disorder (OR = 3.66, 95% CI 2.71–4.96). The prevalence of hallucinations in individuals with BPD was 13.7% (OR = 4.62, 95% CI 1.30–16.39), which did not differ from the prevalence in those with mental disorders (12.6%, $\chi^2 = 0.03$, $P = 0.92$). Looking at a continuous score of BPD traits in the total sample, the correlation between hallucinations and BPD was statistically significant but was weak ($r = 0.195$, $P < 0.001$).

Discussion

Using a large, population sample, we found that (a) the prevalence of BPD in individuals with hallucinations was low (1.3%); (b) the prevalence of mental disorders in individuals with hallucinations was high, most notably for generalised anxiety disorder (11%) and depression (10%); (c) the prevalence of hallucinations in individuals with BPD (13.7%) did not differ significantly from the prevalence of hallucinations in individuals with a common mental disorder (12.6%); and (d) the correlation between hallucinations and BPD traits was weak (although statistically significant). An important nosological finding of the study was that, despite being named for being on a borderline between neurosis and psychosis, hallucinations were, in fact, no more prevalent in BPD than in most 'neurotic' mental disorders. In fact, the prevalence of hallucinations in BPD was higher only relative to one of the seven neurotic disorders assessed (generalised anxiety disorder).

There have been few empirical studies to date on hallucinations in clinical samples with BPD, although these have typically shown higher prevalences of psychotic experiences in general than the current study.[5] There may be a number of reasons for this. For one, this could be attributable to Berkson's bias, whereby when individuals with BPD have hallucinations they are more likely to attend mental health services relative to, for example, individuals with an anxiety disorder who have hallucinations. This would create a (false) impression that BPD is inherently associated with a higher prevalence of hallucinations. We plan to investigate this in future research. It may also be the case that individuals with BPD more readily disclose their hallucinations in mental health clinics, without necessarily being asked in detail about these symptoms, compared with individuals with neurotic disorders. The results of the current study, however, suggest that individuals with neurotic disorders do, in fact, report hallucinations at least as frequently when they are specifically questioned about these.

Strengths of the current report include a large sample size, a nationally representative sample, a validated measure of hallucinations and assessment of personality disorders conducted by trained clinicians. The prevalence of BPD in this study was relatively low compared with some international studies;[13] the reasons for this are unclear. However, we also had a continuous measure of BPD traits in the full population sample and results of both categorical and continuum analyses were consistent.

In conclusion, a very small minority of individuals with hallucinations have BPD – 1%, compared with 11% who had a generalised anxiety disorder and 10% who had a depressive disorder. Despite clinical anecdotes to the contrary, when systematically assessed, hallucinations were no more prevalent in individuals with BPD than they were in those with most (neurotic) mental disorders.

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First received 20 Mar 2016, final revision 14 Oct 2016, accepted 3 Nov 2016

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https://doi.org/10.1192/bjp.bp.116.185249 Published online by Cambridge University Press