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Religious delusions in patients admitted to hospital with schizophrenia

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■ **Abstract** *Background* Religious delusions are clinically important because they may be associated with selfharm and poorer outcomes from treatment. They have not been extensively researched. This study sought to investigate the prevalence of religious delusions in a sample of patients admitted to hospital with schizophrenia, to describe these delusions and to compare the characteristics of the patients with religious delusions with schizophrenia patients with all other types of delusion. *Method* A cross-sectional investigation was carried out. The prevalence of religious delusions was assessed and comparisons were made between religiously deluded patients and a control group on demographic, symptom, functioning and religious variables. One hundred and ninety-three subjects were examined of whom 24% had religious delusions. *Results* Patients with religious delusions had higher symptom scores (as measured by the PANSS), they were functioning less well (as measured by the GAF) and they were prescribed more medication than those patients with schizophrenia who had other types of delusion. *Conclusion* It is concluded

that religious delusions are commonly found in schizophrenia and that by comparison with other patients who have schizophrenia, those patients with religious delusions appear to be more severely ill. This warrants further investigation.

■ **Key words** Schizophrenia – religious delusions – religion

Introduction

This study arose from a desire to establish the prevalence of religious delusions in a population of patients admitted to hospital with schizophrenia and to make a start in developing a cognitive model for the development of these delusions. Religious delusions are of interest because they may have an impact upon an individual's health belief model (Kelly et al. 1987) and, thus, their adherence to treatment. There have been a number of well-publicised cases, in which patients with what would appear to be religious delusions have acted upon these delusions with fatal consequences. Aside from the rare occurrence of these homicides, religious delusions are of clinical significance for two reasons. In case studies, religiously deluded people took literally statements in the bible to pluck out offending eyes or cut off offending body parts (Blackner and Wong 1963; Field and Waldfogel 1995; Kushner 1967; Waugh 1986). Religious delusions have also been associated with poorer outcomes from treatment (McCabe et al. 1972; Thara and Eaton 1996; Doering et al. 1998). The reasons for these consequences of religious delusions are unclear and the publications referenced do not always clearly specify a proposed mechanism of action for these consequences of having religious delusions. There have been few dedicated scientific investigations of religious delusions in schizophrenia.

The content of delusions has been shown to vary between populations and over time (Ndeti and Vadher 1984; Ndeti and Vadher 1985; Kent and Wahass 1996;

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Al-Issa 1995). Religious delusions were more prevalent in the past than currently, though, even in a largely secular society, we still encounter people with schizophrenia who have a religious content to their delusions. To some extent this should be anticipated, since the majority of people, even in the UK, are reared within a culture where religious belief to some degree is the norm. Delusional ideas being on a continuum with normal beliefs (Harrow et al. 1988) is supported by a number of sources, with researchers concluding that normal religious beliefs are held in many cases as overvalued ideas, somewhere between delusions and “normal beliefs” (Jackson 1991; Strauss 1991; Jones and Watson 1997; Peters et al. 1999). It seems likely that many religiously deluded patients will have shifted along the continuum from the “normal” but overvalued religious ideas eventually to religious delusions.

When psychotic experiences are encountered, people seek causal explanations for these (Maher 1988) and will inevitably draw upon their existing knowledge and belief systems. In a recent model of positive symptoms of psychosis (Garety et al. 2001), biased appraisal is said to contribute to a tendency for anomalous experiences to “feel external”, resulting in a cognitive style characterised by jumping to conclusions, external attributional bias and deficits in understanding social situations (Garety and Freeman 1999). Attribution theory offers a potential mechanism for the movement along this continuum towards religious delusions. Belief in the authenticity of auditory hallucinations as the voice of an omnipotent being such as God, speaking to them personally, could account for at least some patients with religious delusions. Religious people, not necessarily those with psychosis, have been shown to make religious attributions for events. Religious people are said to demonstrate an attributional style which is typically different from non-religious people (Shrauger and Silverman 1971; Proudfoot and Shaver 1975; Hood and Morris 1981; Spilka et al. 1985; Pargament and Hahn 1986; Jackson and Coursey 1988; Hood et al. 1990; Lupfer et al. 1992; Pfeifer 1994). Having a religious belief or having religious delusional belief provides a framework by which people can make sense of negative life experiences. This is said to be helpful to people as it allows them something of a buffer against the depressing effects of uncontrollable life stresses (Park et al. 1990).

To summarise, religious beliefs are fairly common and are not pathological. Religious people demonstrate an external attributional bias. A proportion of people will experience psychotic experiences, some of which will involve auditory hallucinations. There will be an attempt to make sense of these experiences and the religious people in particular are more likely to make sense of their psychotic experiences by developing religious delusions. These religious experiences and delusions may help the person to deal with the negative life events which they are faced with.

Since religious delusional explanations should be anticipated in any culture where religion is present, one

might also expect that cultures in which religion is a more powerful influence would produce higher rates of religious delusions. This is in fact what has been established, with figures regarding the prevalence of religious delusions in schizophrenia varying from 7% in Japanese patients, 21% in Germans (Tateyama et al. 1993) up to 80% (Kiev 1963) in Afro-Caribbean populations. It is clear that the prevalence of religious delusions varies massively between populations, though there are differences in definition of religious delusion which may affect the prevalence rates. In many of the studies mentioned, the actual definition of what was considered a religious delusion was not outlined.

A clear definition of religious delusions can be established from a set of criteria published by Sims (1995). These criteria could be utilised to ensure reliability and also ensure that normal socially acceptable religious beliefs were not mis-classified as being religious delusions. According to these criteria, a belief can be characterised as a religious delusion if it meets the following characteristics:

1. both the observed behaviour and the subjective experience conformed with psychiatric symptoms in that the patient's self-description of the experience was recognisable as having the form of a delusion;
2. there were other recognisable symptoms of mental illness in other areas of the individual's life; other delusions, hallucinations, mood or thought disorder and so on;
3. the lifestyle, behaviour and direction of the personal goals of the individual after the event or after the religious experience were consistent with the natural history of mental disorder rather than with a personally enriching life experience.

Delusions are recognised to be multidimensional phenomena, continuous with normality (Garety and Hemsley 1994). Since there has not yet been an extensive investigation of the phenomenon of religious delusions, we are unable to say if or how each of the dimensions of religious delusions might differ from the dimensions of other delusions. In particular, we are unable to evaluate whether any differences might offer a mechanism for the findings indicated earlier, relating to poor outcomes in patients with religious delusions. One dimension which could affect both response to command hallucinations and attributions is belief conviction. It has been shown (Applebaum et al. 1999) that religious delusions are held with greater conviction than other types of delusion. Reaction to hypothetical contradiction (Brett-Jones et al. 1987) is another measure of the severity of a delusion. It can be used to evaluate the patient's responsiveness to evidence, contrary to the delusional idea. This measure can be used as a predictor of change, whilst also giving an additional indication of the certainty of the delusion and the patient's tendency to incorporate contradictory evidence into a delusion. Low scores on this measure are indicative of a dismissal of relevant evidence, a factor likely to contribute to delusion maintenance. As well as conviction and reaction to hypothetical contradiction,

other relevant dimensions of delusional ideas would potentially include other amount of pre-occupation, distress and lifestyle disruption. Potentially relevant dimensions of hallucinations would include the patient's beliefs regarding the origin of their hallucinations, frequency, duration, loudness, negative content and distress.

Understanding more about the nature of the delusions themselves is a necessary step if we wish to develop a cognitive model for the development of religious delusions. Despite the number of varied studies dealing with religious delusions in the past, it has not been empirically established that religious delusions and religious beliefs are even independent of each other and that religious delusions can be reliably identified.

The aims of this study were to:

1. establish the prevalence of religious delusions in a population of patients admitted to hospitals in Greater Manchester;
2. describe the dimensions of these delusions and categorise them;
3. compare the patients with these delusions with a comparison group of patients with schizophrenia, but with all other types of delusion. Comparisons were to be made on demographic, symptom, functioning and religious variables. In particular we wished to explore any differences in diagnosis, onset of symptoms, conviction and pervasiveness of psychotic symptoms, and history of religiosity;
4. begin developing a cognitive model of the development of religious delusions.

Subjects and methods

An algorithm for reliably establishing religious delusions was developed. A cross-sectional examination of the prevalence and description of religious delusions in a population of recently admitted psychiatric in-patients was carried out.

Two groups of schizophrenic patients were compared. A group who met criteria for religious delusions and a group who did not meet these criteria. The comparison group, therefore, consisted of schizophrenia patients with all other types of delusion than religious delusions. The two groups of patients were compared on: demographics, symptoms, functioning and religiousness.

Measures

The Positive and Negative Syndrome Scale for Schizophrenia (PANSS; Kay et al. 1989) was used to evaluate the extent and severity of psychotic symptoms. The Global Assessment of Function (GAF; Endicott et al. 1976) was used to evaluate the patient's current level of functioning. The Hallucination Scale (AH) and the Delusion Scale (DS) from PSYRATS (Haddock et al. 1999) were used to evaluate the dimensions and severity of these particular symptoms. Reaction to hypothetical contradiction was also used as a means of assessing an additional dimension to the delusions.

Religiosity was assessed using the patients' own classification of whether they said they were religious or not when asked to make a forced choice, and the degree of religiosity which the patients believed characterised them, on a scale from 0 to 10 (0 = not at all religious, 10 = extremely religious). The patients' assessment of whether their religiosity had altered in the past, and their assessment of their

parents' general degree of religiosity were established at interview. Patients were asked to complete a Doctrinal Orthodoxy questionnaire which establishes the degree to which an individual holds beliefs in accordance with (mainly Christian) religious doctrine.

The presence of religious delusions was established using questions from the Present State Examination (PSE; Wing et al. 1974) supplemented by the additional criteria mentioned earlier (Sims 1995) and the algorithm which was developed and evaluated. During the investigation, where doubt remained regarding whether a belief was a normal religious belief or a religious delusion, the patient was categorised as not being religiously deluded.

Development of the algorithm for establishing religious delusions

Twelve mental health professionals (psychiatrists, clinical psychologists, psychiatric nurses and trainee clinical psychologists) were asked to categorise written case examples as being religiously deluded or not using the criteria outlined earlier from Sims (1995). The ten case examples were based upon real patients with schizophrenia and contained case examples of religious but not religiously deluded patients, religiously deluded patients, non-psychotic patients, and schizophrenia cases with no religious phenomenology at all. The overall average Kappa score was 0.65 with a range of scores from 0.16 to 1.00. The average Kappa score between the first author and the mental health professionals was 0.75 with a range from 0.40 to 1.00.

A more elaborated algorithm was developed (see Fig. 1) which addressed these issues and in particular assisted in the separation of normal religious behaviour from religiously delusional behaviour. The mental health professional raters were reminded that the definition of acceptability of beliefs related to acceptability from the perspective of a churchgoing, non-psychotic religious person, and not necessarily to themselves. An explanatory note about there being no

Does the patient have a belief (include the attribution of hallucination) which has the characteristics of a delusional idea, e. g. an idea which is firmly held, it may be bizarre, is not amenable to reason? Absolute certainty is not necessary, though there should be more than a suggestion.

Does the patient appear to have any other symptoms of a psychotic illness, e. g. other delusions, hallucinations, thought disorder, anxiety etc.? This should exclude those who have had an intense religious experience.

Is there a religious content to these ideas expressed? Include such topics as God, the Devil, spirits, angels, etc.

Are any religious ideas expressed likely to be unacceptable to the patient's peers? Would non-psychotic churchgoing religious people also find these ideas unacceptable?

Are the patient's lifestyle/goals etc. more suggestive of a psychotic episode than an enriching life event? Was this a religious experience or was it a psychotic episode?

Fig. 1 Religious delusions algorithm

need for the patient to demonstrate absolute certainty of belief was also added to the algorithm.

Tape recordings of real patients with a schizophrenia diagnosis being interviewed by the first author were then played to mental health professionals who were asked to categorise the cases and non-cases using the modified algorithm. These recorded cases were selected to include a variety of presenting problems, both sexes and a range of ages. These subjects were two mental health professionals and a volunteer worker. The mental health professionals were selected from either end of the spectrum regarding diagnostic experience. One subject was an experienced and trained psychiatrist and the other was an assistant psychologist, with less than 12 months of work experience. The volunteer subject was a recently qualified graduate in psychology with no clinical experience.

Mental health professionals were asked to follow the algorithm and to establish the cases who had religious delusions from a series of patient interviews. The mental health professionals knew neither which patient had religious delusions, nor even whether there were any patients with religious delusions within the series played to them. These 16 tape-recorded cases were interviews in which the patients were asked enough questions to establish the presence or absence of religious delusions. When the tape recordings of real patients being interviewed were used, the professionals were in agreement with the author on 96% of cases. The Kappa score was 1.0 between the author and the relatively untrained mental health professionals, and 0.75 with the psychiatrist. These results offer support for believing that this algorithm for establishing whether a patient had religious delusions has satisfactory reliability.

■ Subjects

Subjects were patients with a diagnosis of schizophrenia, schizoaffective disorder, schizophreniform psychosis or delusional disorder according to criteria laid down in DSM IV (American Psychiatric Association 1994). These were drawn from a consecutive sample of all new admissions and re-admissions to 23 psychiatric wards of six NHS trusts within a fixed catchment area covering much of Greater Manchester. Inclusion criteria included the ability to give informed consent and no significant history of organic brain disease or substance misuse as the major aetiological factor for their psychosis. Exclusion criteria included an inability to speak English or severe thought disorder such that informed consent was not possible. These patients were later separated into patients with religious delusions and those who had schizophrenia but no religious delusions, using the algorithm described above.

■ Procedure

Wards were contacted weekly for patients with a possible diagnosis of schizophrenia. The medical records of all possible cases were examined to confirm suitability. In accord with local ethics committee guidelines, ward staff were requested to ask if the patient was willing to co-operate in the study and consent was obtained.

Interviews were carried out by the first author in the following order: demographics, religiosity, PANSS, including the specific extra questions from PSE to establish the presence or absence of religious delusions. It was assessed by reference to the criteria in Fig. 1 whether a patient's responses indicated that he/she had symptoms which satisfied criteria for a religious delusion. Where a patient had not met these criteria for religious delusions, the patient's most severe delusional idea identified by the questions from the PSE interview was assessed. Measures of delusional dimensions such as PSYRATS (DS and AH) and reaction to hypothetical contradiction were conducted next. GAF rating was completed last using the information already derived.

All data were analysed using SPSS version 9. Variables were examined for normality and appropriate parametric and non-parametric analyses were carried out.

Results

■ Characteristics and description of the subjects involved

In total, 355 subjects met the inclusion criteria. However, 162 of these patients refused to participate, leaving 193 who were successfully recruited into the study.

The subjects comprised 135 males (70%) and 58 (30%) females. The majority of this sample (158 subjects, or 82%) classified themselves according to OPCS criteria (Aspinall 1995) as white European. The Asian categories together accounted for nine subjects (5%). In the "black" categories there were 24 subjects (12%). The sample had a median age of 35.1 years (range 18.4–64.8). Half of the subjects ($n = 95$) had been educated up to secondary school level. A further 60 subjects (31%) had studied beyond this level at a vocational or technical college, while 33 subjects (17%) had studied at university level. The majority of the sample ($n = 157$ subjects, 82%) were unemployed or receiving some kind of alternative benefit. Nineteen patients were working in either a manual or semi-skilled occupation and five patients held managerial or professional occupations. Four housewives were included and also four students. There was one retired patient and two patients in the "other" category whose occupations were difficult to categorise.

One hundred and forty-five subjects (76%) met DSM IV criteria for schizophrenia. Schizoaffective disorder criteria were met by 16% (31 subjects) and 15 subjects met criteria for schizophreniform disorder (8%). Only one subject met criteria for delusional disorder. The sample had a history of mental health problems of approximately 7 years at the time of admission (median 84 months, range 1–456 months).

Most of the patients were prescribed anti-psychotic medication; however, 19 patients were not prescribed any anti-psychotic medications at the time of rating. The conventional anti-psychotic medications prescribed were converted into chlorpromazine equivalents. The median daily dose of chlorpromazine equivalents was 200 mg (range 0–5625 mg). Where patients were prescribed atypical anti-psychotic medications, the most popular was olanzapine, which was prescribed in 46 (24%) patients. Thirty-five per cent of the sample (67 patients) were detained under one of the sections of the 1983 Mental Health Act.

One hundred and thirty subjects (68%) described themselves as religious. Across the whole sample the median response when these patients rated their own religiousness on a scale from 0 to 10, was 5 with scores ranging from 0 to 10. Excluding those subjects who said they were not religious, the median response of those self-identified as religious was 7 with scores ranging from 0 to 10. This was a sample largely of self-identified Christians, made up of Roman Catholics ($n = 64$, 34%) and 61 subjects (32%) selecting Church of England. "None" was the second largest "religious" category, (encompassing atheists and agnostics) selected by 23 subjects (12%).

There were nine (5%) Muslims, four (2%) Jewish and smaller numbers of patients endorsing faiths which they categorised as: Born again Christian, Pentecostal, Mormon, Buddhist, Jehovah's Witness. One subject selected more than one denomination and four said that they belonged to "my own faith".

■ The prevalence and description of religious delusions

Of the 193 patients examined, 45 had religious delusions using the algorithm outlined earlier. PSE categorises religious delusions as either primary or secondary, though this categorisation fails to exploit the richness of content often found in these delusions. Using a published classification, religious delusions can be summarised into three categories dealing with the content of the delusions (Wilson 1998). These categories are: Persecutory often including the Devil; Grandiose including the Messiah complex; Belittlement including such things as unpardonable sins. For this study, a fourth category was added which deals with secondary religious delusions. Clearly some delusions covered more than one category.

■ Comparison of religiously deluded with non-religiously deluded subjects

Patients with religious delusions and the comparison group (who had schizophrenia but did not meet criteria for having religious delusions) were similar in terms of: age, sex, educational level achieved and marital category. Twenty-four per cent of people labelling themselves as white European had religious delusions. The other ethnic categories had smaller percentages of people with religious delusions. When all of the black, West Indian and Afro-Caribbean categories were combined, 17% of this group had religious delusions. A similar re-coding was performed on the Asian categories and the percentage with religious delusions was 14%. These different rates were not significantly different when cross-tabulated.

There were no significant differences between the number of cases of religious delusions in the different diagnoses involved in this study. The patients with religious delusions had mental health problems for significantly longer than those without religious delusions ($U = 2513.0, p = 0.03$). The median number of months since the first contact with psychiatric services in the subjects who were religiously deluded was 97 months (IQR = 48–240). In those subjects who were not religiously deluded, the median number of months since first psychiatric contact was 72 (IQR = 20–154).

Those with religious delusions were prescribed larger doses of conventional anti-psychotic medication than the comparison group. The religiously deluded group were prescribed a significantly higher amount of chlorpromazine equivalent per day ($U = 2410.0, p = 0.018$; median = 500 mg; IQR = 0–900) compared with those who had no religious delusions, who were pre-

scribed a median daily dose of 200 mg of chlorpromazine equivalents (IQR = 0–500). There were no significant differences between the groups in the numbers who were not prescribed any medication at all or the patients prescribed atypical anti-psychotic medications.

■ Religiosity

The religiously deluded subjects were found to be more religious on self-assessed degree of religiosity than were the comparison group ($U = 2433.5, p = 0.015$). The religious delusion patients' scores on Doctrinal Orthodoxy were also higher ($U = 1031.5, p = 0.02$). Being religious is significantly more likely to be associated with religious delusions (chi squared = 4.18 [1], $p = 0.041$); however, identifying oneself as being religious is not necessary to experience religious delusions. Thirty-six of the patients with religious delusions identified themselves as religious though nine patients who had religious delusions did not. Of the patients without religious delusions 91 identified themselves as religious, with 52 identifying themselves as not religious. Using these figures, it was possible to calculate an odds ratio for the likelihood of a person having religious delusions from this sample. The odds of a person self-identified as religious also having religious delusions is more than twice that of someone who does not identify himself as religious (OR 2.29).

A logistic regression analysis was also conducted using the presence or absence of religious delusions as the dependent variable. Variables were selected in accordance with a theoretical expectation that they would be of relevance. Variables were then tested individually using chi squared, Mann-Whitney and T tests to determine their effect upon the dependent variable. From these analyses relevant variables were entered into a logistic regression analysis individually. Care was taken when selecting variables to minimise collinearity. Where categorical variables had too few subjects per category, dummy variables were created. Though the logistic regression described above gave indications of variables with the largest odds relating to the development of religious delusions, there was clearly a potential for variables interacting. Accordingly, a multiple logistic regression analysis was conducted, aiming to find the smallest combination of predictive factors which influence a person developing religious delusions. Having identified the variables which exerted influence on their own, a backwards stepwise logistic regression was carried out to remove, one by one, the variables which in combination exerted the least predictive power (Table 1).

It is possible to see that variability in religiosity in the past would appear to give the greatest odds of an individual developing religious delusions. Having hallucinations also increases the odds of a person developing religious delusions by almost 5:1 and having a high score on the Doctrinal Orthodoxy scale almost doubles the odds of developing religious delusions.

Table 1 Results of multiple logistic regression analysis

Variable	Significance	Odds Ratio	95% CI of OR
Prior religiosity variable	0.0005	9.92	2.70–36.44
High Doctrinal Orthodoxy score	0.007	1.60	1.13–2.26
Degree of religiosity (self)	0.11	0.84	0.68–1.03
Christian	0.07	0.29	0.07–1.10
Hallucinator	0.008	4.76	1.50–15.12
More time since first contact with psychiatry	0.0003	1.01	1.00–1.02

■ Psychotic symptoms

Overall pathology and psychotic symptoms were measured using the PANSS total score, the PANSS positive scale, PSYRATS, the assessment of reaction to hypothetical contradiction and the GAF. The PANSS total scores ranged from 40 to 119. The mean score across the whole sample was 73.5 (SD = 16.2). The positive scale of PANSS, which contains the majority of the hallucinatory and delusional items, revealed overall mean scores of 20.5 (SD = 5.86) which ranged from 7 to 36. The PSYRATS (DS) scores ranged from 0 to 24 with a median score of 16 (IQR = 9–20), and the PSYRATS (AH) scores ranged from 7 to 39 with a median score of 27 (IQR = 23–31). Over 50% of the sample reported no auditory hallucinations. Reaction to hypothetical contradiction produced responses ranging from 1 (the evidence would be false/you would be lying), to 5 (I know that I am ill) with a mode response of 2 (still sure). GAF scores ranged from 15 to 90 with a median score of 50.

Table 2 shows the findings of comparisons between the religiously deluded subjects and those without religious delusions on the main psychiatric measures. Parametric statistics have been used where data were normally distributed.

Individual items from the PSYRATS scales were also examined. There were significant differences between

the religiously deluded and non-religiously deluded in the certainty of their belief in the delusion ($U = 2365.5$, $p = 0.04$). The religiously deluded had more conviction in their delusions than the non-religiously deluded (religiously deluded median score = 4, non-religiously deluded median score = 3; $U = 2365.5$, $p = 0.04$). There were also significant differences between the groups in their beliefs about the origins of their hallucinations. The religiously deluded were more likely to indicate more certainty in an external cause for their voices than an internal cause (median score = 2), compared with the non-religiously deluded patients (median score = 0; $U = 2319.5$, $p = 0.008$). The other dimensions of the delusions and hallucinations were not different between the two groups. Reaction to hypothetical contradiction likewise showed no difference between the religiously deluded and non-religiously deluded.

■ Psychotic symptoms and religiosity

Scatter plots and Spearman's Rho were examined to assess linear relationships between the variables assessing religiosity and those measuring psychotic symptomatology. There were no obvious and clear linear relationships between psychotic symptoms in general and religiosity with a correlation coefficient of 0.06 ($p = 0.36$) indicating the strongest relationship between these variables. This correlation coefficient was between self-assessed religiosity and the PANSS positive scale and was neither strong nor statistically significant.

■ Eligible refusers

Less data were available for the eligible patients ($n = 162$) who refused to participate, although an examination of their medical notes revealed that for the variables

Table 2 Results of the comparison between the religiously deluded and those without religious delusions on the main psychiatric measures

Measure	Finding	Comments
PANSS total	Patients with religious delusions score mean 8.5 points more than those with other delusions. (95% CI = 3.4–13.5)	$t [84.19] = 3.34$ $p = 0.001$
PANSS positive scale	Patients with religious delusions score mean 2.7 points more than those with other delusions. (95% CI = 0.76–4.7)	$t [74.79] = 2.76$ $p = 0.007$
PANSS negative scale	Patients with religious delusions score mean 0.2 points more than those with other delusions. (95% CI = -1.7 to -2.1)	$t [183] = 0.216$ $p = 0.83$
PANSS general scale	Patients with religious delusions score mean 5.5 points more than those with other delusions. (95% CI = 2.6–8.5)	$t [87.5] = 3.75$ $p = 0.000$
GAF score	Patients with religious delusions score mean 5 points lower (poorer functioning) than those with other delusions. (95% CI = -10.3 to -0.3)	$t [80.15] = 2.110$ $p = 0.038$
PSYRATS : DS	Patients with religious delusions score median 1 point (median 16 : IQR 12–20) more than those with other delusions (median 15 : IQR 9–20)	$U = 2590.5$ $p = 0.23$
PSYRATS : HS	Excluding those not hallucinating those with religious delusions score median 1 point less (median 27 : IQR 22–31) than those with other delusions (median 28 : IQR 23–31)	$U = 852.5$ $p = 0.92$

which could be examined (age, sex, hospital, diagnosis) there were no significant differences between the patients examined and those who refused to participate. Eighteen of these patients (11%) were considered by their clinical teams to have a religious delusion, though clearly these delusions have not been scrutinised according to the criteria discussed earlier. Where information was given it appears that grandiose religious delusions were the most common (five subjects), secondary religious delusions were next (three subjects) with only one subject each for the categories of religious belittlement and persecutory religious delusions. In seven subjects the religious content was not specified.

Discussion

This study has demonstrated that it is possible to reliably identify religious delusions. This was done using an algorithm which proved invaluable in separating religious, but normal, ideas from religious delusions. The prevalence of religious delusions at 24% was between the figures quoted earlier (7% and 80%) and is consistent with expectations.

The most common type of religious delusion was a secondary religious delusion in which the patient heard a voice or had some other hallucination attributed to be that of God or the devil. This result reinforces the poll finding (Gallup and Newport 1991) that 10% of non-psychotic Americans asked believed that they had personally talked with the devil. Religiously attributed hallucinations are, it would appear, commonly experienced in both the normal and psychotic populations. Given that a significant number of "normal" people are experiencing such similar phenomena to a religiously deluded sample, the presence of other psychotic symptoms would be crucial to establishing reliably the presence of religious delusions. One cannot help wondering if the 7% of patients with religious delusions in Japan (Tateyama et al. 1993) are merely representative of a population of people having unusual religious experiences, some of which may be delusions. Believing oneself to be a grandiose religious figure such as God, Jesus or an angel was found to be the second most common delusion in this sample and belief in being possessed by the devil or demons was also commonly found.

It was established that not all people with religious delusions classed themselves as being religious. This clearly highlights an issue of how people define religiousness, with some differences and discrepancies between people. Despite these anomalies, it was not surprising that the religiously deluded tended to score more highly than the other patients with schizophrenia, who did not have religious delusions, on the measures of religiosity. One explanation of this is that the religiously deluded may have a greater need for religion at times of crises (Pargament and Brant 1998; Pargament et al. 1998). It is possible that the patient's self-assessment as being more religious is an effect of this enhanced need,

rather than a developmental factor in the patient's psychotic symptoms. The religiosity of people with schizophrenia has been shown in earlier research (Wilson et al. 1983) to be more likely to have altered during adolescence than that of non-psychiatric controls. This was supported by the finding from the multiple logistic regression analysis which showed that variations in religiosity were associated with an increased risk of developing religious delusions. It is possible that these patients who are identified as being religiously deluded have in fact varied their own religiosity in response to earlier need. Though we asked patients about prior religiosity, it is clear that this study was not able to evaluate for certain that the patients' religiosity pre-admission was as they stated it to have been. Enhanced religiosity may, therefore, be an effect of religious delusions rather than a contributory cause.

Research has shown that religious people and psychotics demonstrate a different attributional style to non-religious people and they are more likely to make religious attributions of cause when faced with unusual psychotic experiences. Our findings on attributions of hallucinations offer some support for this position. Our religiously deluded patients were more likely to demonstrate a more external attribution for their hallucinations than were the patients who had other delusions but did not meet criteria for religious delusions. Other possible risk factors for religious delusions were the presence of hallucinations and length of time since their first episode of psychosis. The psychiatric ratings demonstrate that, on admission, the patients with religious delusions have a longer history, have more extensive symptoms and poorer functioning than the other patients with schizophrenia who have different types of delusion. Why these patients should have a longer history at admission is not known. Our findings suggest that patients who have religious delusion may have been exposed to more extensive psychotic symptoms, particularly hallucinations, for a longer period. In accordance with the model of positive psychotic symptoms presented by Garety and colleagues (2001), it is possible that, over time, a proportion of these patients will develop a religious attribution for their symptoms, some of which meet criteria for a religious delusion. When their behaviour becomes problematic, these patients may be admitted to hospital. It is unlikely that these patients were well immediately before admission. If we consider the 10% of Americans who believe that they have communicated with the devil, we can imagine that, even in a largely secular society like the UK, there may be fewer concerns in family members about patients with religious delusions. Religiously deluded patients making religiously delusional attributions of their hallucinations may, in religious families, cause fewer concerns than patients with other types of delusional ideas. This may go some way towards explaining why patients with religious delusions were more severely ill at the point of admission than were patients with all of the other types of delusion.

The interpretation of these findings may be limited because the rater was not a blind, independent rater. Nonetheless, the presence of the significant differences between the two groups of patients in terms of the amount of their prescribed psychiatric medication (by clinicians uninvolved with this research) offers additional support for the notion of real and clinically significant differences in severity between the two groups examined. Of course, there may be other reasons why these uninvolved clinicians should prescribe more medication for patients with religious delusions. There may be an element of prejudice against religious ideation, particularly from a group considered to be unreligious, as psychiatrists are (Bergin 1980).

Interestingly, the percentage of religiously deluded people found from within the black and Afro-Caribbean subjects in this study was at 17% lower than the rate found across the whole sample (24%). This figure was lower than each of the rates mentioned by other researchers for West Indians who were citing figures of up to 80% (Gordon 1965; Littlewood and Lipsedge 1981). There may be a number of reasons for this anomaly. It is possible that the previous research, without the benefit of a clear set of criteria for establishing religious delusions, categorised inappropriately a number of people with religious beliefs who were not deluded. A proportion of these patients perhaps expressing some of the normal religious beliefs of their own culture would have been wrongly categorised as deluded. By having these criteria, the assessor was obliged to consider the degree of religiosity and specific beliefs of that person's cultural group. Accordingly, there could have been patients from an Afro-Caribbean background who were categorised as not meeting the criteria for religious delusions because their beliefs were culturally acceptable. On the other hand, it is conceivable that a European patient with the same religious beliefs may have met criteria and been categorised as being religiously deluded because of differences in the social acceptability of these religious beliefs among the patient's peer group.

The major limitation of this study was its selection of people recently admitted to hospital. Although these are the people with whom psychiatric workers have to work, they are not the only people who have schizophrenia and have religious delusions. It is highly probable that large numbers of people in the general population are functioning with similar symptoms. Given the relative acceptability of some religious delusions, particularly within a religious family, these ideas may, despite being delusional, be less unacceptable to other family members and accordingly admission to hospital may be less likely. Unfortunately, such normative data are not available and, for the time being, we are left to speculate.

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