A case study exploration of the value of acupuncture as an adjunct treatment for patients diagnosed with schizophrenia: results and future study design

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Objective: This study explored the effects of individualized acupuncture when used alongside routine care for patients diagnosed with schizophrenia in order to assess the possibility and nature of potential benefits for this patient group. This study used an exploratory case study approach that included both quantitative and qualitative research tools, in order to generate a hypothesis questioning the possible benefits of acupuncture and develop future study designs. Methods: Eleven patients diagnosed with schizophrenia were given multiple validated quantitative and qualitative assessments before, during and after a 10-week acupuncture intervention. A range of qualitative and quantitative assessments were employed including review of acupuncture, general practitioner and mental health clinical case notes. Qualitative data were interrogated to explore the reliability of participants’ reports to researchers, their clinicians and their carers while acting as informants in the study. Results: Eight out of eleven participants completed a course of acupuncture treatment and all eleven reported positive benefits as a result of acupuncture, including improvements in the symptoms of schizophrenia, side effects of medication, energy, motivation, sleep, addictions and other associated physical problems. However, participants’ reports to the researcher and the acupuncturists varied at times and were often inconsistent between treatments, with participants revealing more information to the team towards the end of the study. Conclusion: The study indicates that patients diagnosed with schizophrenia would benefit from acupuncture treatment alongside conventional treatment. Triangulation of the data highlights

DOI: 10.3736/jcim20110507
http://www.jcimjournal.com


Received December 26, 2010; accepted February 15, 2011; published online May 15, 2011.

基金项目：This study was supported by grants from the British Acupuncture Council, the Sir Charles Jessell Foundation and Canterbury Christ Church University.

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some inconsistencies in reporting from participants, but also that this can be overcome through the use of mixed research methods. Comparison of data also shows that future studies would benefit from using a Positive and Negative Syndrome Scale, the Standards for Reporting Interventions in Controlled Trials of Acupuncture and an enhanced questionnaire regarding side effects of medication, exercise, sleep and daily routine. It is also worth noting that future studies of this nature must maintain consideration for the vulnerability of participants as they recover and make support easily accessible.

Keywords: schizophrenia; acupuncture; the Positive and Negative Syndrome Scale; STRICTA; research design

The aim of this paper is to present and discuss results from a recent study on the use of acupuncture as an adjunct treatment for schizophrenia and to highlight for researchers the utility of mixed research methods, illustrating how triangulation of data can strengthen and inform results. The article is relevant not only to researchers but also to acupuncturists who have an interest in the field of mental health. The paper begins by outlining reasons supporting the use of acupuncture in the treatment of schizophrenia; it then describes and justifies the methods used, how recruitment took place and issues with sampling, the results, including acupuncture diagnoses, points used and treatment outcomes. The discussion focuses on triangulation of the data and how the different research tools employed informed and confirmed research findings, allowing reliable conclusions to be drawn and the formation of future studies.

1 Background information

1.1 Schizophrenia Schizophrenia affects around 1% of the UK population and its prevalence is set to increase, not least in developing countries due to its association with urbanisation and poverty[3,4]. The condition itself leads to poverty, social isolation, poor physical health, self-harm and suicide[5]. The onset of schizophrenia is usually in early adult life, affecting most patients for the rest of their lives. Treatment is usually with antipsychotic medication, though emerging research has demonstrated that treatment with psychological therapies may be useful in the early stages[6-10].

However, treatments for schizophrenia remain limited and unsatisfactory. In the UK, complementary treatments such as acupuncture are rarely available for schizophrenia, even though they have become more popular amongst the general population for conditions including mental health problems[11,12]. Although healthcare in the UK is free on the National Health Service, for the most part complementary medicine is excluded from the treatments available[13]. Patients diagnosed with schizophrenia tend to be unemployed and living on state benefits, so can rarely afford access to such treatments[11].

Symptoms of schizophrenia are described as “positive”, “negative” and “disorganised”. Positive symptoms are those that are overtly active, like hallucinations, delusions and interference with thinking. Negative symptoms are those that center on a lack of activity or engagement, slowness of speech, social withdrawal, blunted, unresponsive mood, lack of motivation and self-neglect. Disorganised symptoms include incongruent and often socially inappropriate behaviour and disrupted or disorganised speech. For someone to be diagnosed with schizophrenia, they must have displayed these symptoms for over 1 month (International Classification of Diseases (ICD-10) criteria[15]) or for over 6 months if assessed according to the Diagnostics and Statistics Manual of Mental Disorders (DSM-IV). Although positive symptoms are clearly difficult to manage, negative ones are more indicative of a poor prognosis[16].

In order to put the study presented here in context, it is worth noting the side effects of antipsychotic medication. These include: (1) Acute dystonia: stiff neck (like a crick in the neck), a stiff protruding tongue, grimacing and muscle spasms in the back and at the joints causing them to bend back and flex rigidly. (2) Akathisia: a feeling of restlessness and inability to keep still, that is often confused with increased psychosis. (3) Parkinsonian syndrome: an expressionless face, rigidity, coarse tremor, stooped posture, lack of associated movements and an involuntary quickening of pace when walking. (4) Tardive dyskinesia: grimacing, sucking and chewing movements of the face, twitching and writhing. Acute dystonia and Parkinsonian side effects can be treated to some extent with anticholinergic medication, and akathisia with benzodiazepams or with reduction of the dose of medication[17]. Some symptoms may disappear within a few weeks, but some may not, even after the course of antipsychotic medication has finished. This is especially true for tardive dyskinesia[18].

Generally, atypical antipsychotics are distinguished from conventional ones because they should: (1) not cause extrapyramidal side effects (EPS); (2) work on negative as well as positive symptoms; (3) improve cognitive performance[19].

However, atypical antipsychotics share many of the side effects of conventional antipsychotics, including EPS, and the evidence for their effect on both negative symptoms and cognitive function is flawed due to small sample size, short treatment period, neglecting the influence of concomitant
anticholinergic medication and other factors\textsuperscript{[19]}. These include sedation, dysphoria, sexual dysfunction, weight gain, adverse endocrine effects, autonomic and cardiovascular effects, anticholinergic effects and seizures\textsuperscript{[20]}. They are less likely to cause extrapyramidal movement disorders and are less sedative than conventional antipsychotics\textsuperscript{[21]}. 

1.2 Acupuncture in the treatment of schizophrenia

The use of acupuncture in the treatment of schizophrenia is virtually unheard of in the West\textsuperscript{[11, 12]}. It is commonly used in China, and is known to be used by a few specialists in the USA and the UK. Most of the few studies available emanate from China. Others have taken place in the USA\textsuperscript{[12, 22, 23]}. Most of the available studies are poorly explained quantitative trials and it is difficult to judge the quality of sampling and treatment, although reporting is better in some more recent studies\textsuperscript{[23]}. Most have shown results that are comparable with antipsychotic medication in terms of efficacy, with the added advantage that acupuncture does not cause side effects and actually tends to lessen the side effects of antipsychotics. Apart from two studies, long term effect is unknown. A closer examination of these studies illuminates numerous issues and makes it difficult to judge whether the results are generally applicable\textsuperscript{[12, 22, 23]}. Comparison with the effect of acupuncture on the brain in functional magnetic resonance imaging studies highlights acupuncture’s possible use in the treatment of schizophrenia, however, these have not yet been explored\textsuperscript{[24]}. 

2 Methods

2.1 The case study approach

Case studies are an established method of making an in-depth examination of an individual, group, organisation or society in order to establish some theoretical foundation that may be applied to other similar cases\textsuperscript{[25, 26]}. Although case study approaches vary, they are thought to have several aspects in common. Firstly, they are always an in-depth examination of a single case (an individual, group, organisation or society: known as a single study), or multiple cases (any number of individuals, groups, organisations or societies thought to differ in some way: known as a multiple case study). They are intensive and focus on a small sample that will produce a large number of variables. They examine all aspects of a “case”, including factors that might be unique to that case\textsuperscript{[27]}. They attempt to explain behaviour and dynamics, rather than isolating variables\textsuperscript{[22, 28]}. Regardless of whether they utilise qualitative or quantitative methods, their aim is to understand the case being studied\textsuperscript{[29]}. The approach is used when the subject to be studied is extreme, unique or revelatory in nature and requires a more holistic approach to understand it\textsuperscript{[30]}. The result of a case study approach is a large collection of detailed information about the various dimensions of a phenomenon.

While most case study research tends to be qualitative in nature\textsuperscript{[31, 32]}, the approach is flexible and allows the researcher to use a number of methods for data collection and analysis and to incorporate qualitative methods and/or quantitative methods\textsuperscript{[32]}. Mixed methods are a valuable and recognised part of medical research\textsuperscript{[33, 34]}. Mixed method approaches are particularly useful in pilot, feasibility and complex intervention studies, where key questions may include: (1) whether interventions are effective in everyday practice; (2) how the intervention works; (3) distinguishing the active ingredients; (4) how they are exerting their effects.

Experts in complex intervention studies recognise the impact of the patient on the outcome and that an outcome may be something that continues to evolve, rather than a “one-off” result that is sustained\textsuperscript{[35]}. The case study approach is a good example of a mixed method or a pragmatic approach, particularly when it employs exploratory or instrumental ideals\textsuperscript{[2]}. 

2.2 How the case study approach was employed in this study

This preclinical pilot study\textsuperscript{[36]} examined the effect of acupuncture on participants diagnosed with schizophrenia using an exploratory and an instrumental case study approach\textsuperscript{[31, 35, 36]}. Participants were treated with acupuncture twice a week for 10 weeks on an individual basis. A variety of methods were used to collect and examine in-depth information on this population, including a number of validated research tools. The study was drawn up in line with the Medical Research Council framework for complex interventions\textsuperscript{[34]}. 

Semi-structured interviews were used to explore issues regarding the patients’ quality of life and experience of acupuncture before and after treatment. In addition, the following scales were piloted in order to determine their use in future clinical trials. These included: the Positive and Negative Syndrome Scale (PANSS)\textsuperscript{[37, 38]}; the Schizophrenia Quality of Life Scale (SOLS)\textsuperscript{[39, 40]}; the Pittsburgh Sleep Quality Index (PSQI)\textsuperscript{[41]}; unstructured observations of acupuncture treatment to confirm or challenge data\textsuperscript{[42]}; examination of mental health and general practitioner (GP) clinical notes; acupuncture notes; and a modified treatment reporting protocol, based on the Standards for Reporting Interventions in Controlled Trials of Acupuncture (STRICTA) guidelines\textsuperscript{[43, 44]}. Preliminary data have been reported\textsuperscript{[45-47]}. Figure 1 provides details of the data collection process used in this study.

2.3 Inclusion and exclusion criteria

Participants included in this study had to be between 18 and 65 years of age, with a diagnosis of schizophrenia, and be able to provide informed consent, understand, read and write English, and articulate their own perceptions of symptoms and side effects. Those with a secondary diagnosis of schizophrenia, or with acutely psychotic, or having concerns about needles or a needle phobia, and who had learning disabilities were excluded from the study.
2.4 Recruitment  There are a number of identified approaches to sampling, depending on the aims of the research and who agrees to participate. Researchers may use more than one strategy for selection. This study used a purposeful sampling approach. The participants selected had a diagnosis of schizophrenia; their condition was stable and they were being treated in the community but were not entirely happy with their treatment outcomes. After obtaining the necessary ethical approval, participants were identified by their GPs and mental health key workers; the study was explained and information was provided, after which participants were approached to give their consent.

Clinicians approached patients who they thought might be interested and who fitted the criteria. It was not very clear to what extent the clinicians understood the treatment. The GPs wrote to all of their patients with the diagnosis. Many mental health clinicians said that they did not have any patients who fitted the criteria. Some patients rejected the study and appeared to have little understanding of what acupuncture was. Those who did come forward, did so very quickly, knew a little about acupuncture and were very keen to get started.

A total of eleven participants were recruited: seven men and four women. Their average age was 38.5 years, seven participants being in their early to mid-forties, two in their twenties and two in their thirties. All of the participants were diagnosed with schizophrenia and had predominantly paranoid features, some with concomitant anxiety, mood disorder or addictive behaviour. All of the participants were being treated with some forms of antipsychotic medication, and eight had another type of medication also prescribed (see Table 1 below). Seven had used cannabis heavily prior to diagnosis, and the same number mentioned that they had been the subject of abuse (bullying, sexual and violent) either as a child ($n = 4$) or as an adult ($n = 7$). Four participants were using alcohol heavily at the start of the study, three daily and one weekly with other drugs such as cannabis and cocaine.

2.5 Statistical analysis  Descriptive statistics were analysed by using SPSS 17.0 software, including factor analysis of time points between cases, t-tests and paired sampling. Means were compared by using one-way analysis of variance and Bonferroni tests.
3 Results

3.1 Benefits reported All of the participants reported some benefit from the treatment, including those who withdrew or later relapsed. Key benefits observed and reported were: decreased side effects of antipsychotic medication; decreased auditory, visual and tactile hallucinations; decreased anxiety and paranoia; improved sleep patterns, including less time in bed and better quality of sleep; increased motivation including increased sex drive and ambition to further themselves in education and work; improved socialisation and concentration which was corroborated by carers; reduced levels of addictive behaviour in relation to alcohol and cigarettes; improved diet and weight loss; improved exercise regimes.

3.2 Statistical results Participants were interviewed and answered questionnaires at three time points during the study (See Figure 1): twice before commencing their course of acupuncture treatment, and once after the course was finished. Although statistical output looked promising, it was not possible to conclude whether results are significant due to the low number of participants. It is however, possible to show the trends in the group and to discern from these statistics whether the instruments used were helpful in measuring the intended outcomes. Readers should note that, for all three research tools used, a reduction in score indicated an improvement in the parameters measured.

3.2.1 Symptoms of schizophrenia: the PANSS

The PANSS includes measurements of 11 different symptoms associated with schizophrenia. It has well established reliability and validity\(^{[27, 28]}\). These results focused on the PANSS total score, in accordance with PANSS Institute advice that this would give the most useful indication of improvement. This is because the participants were relatively highly functioning and living in the community. Due to the low number of participants in this study, statistical significance is difficult to achieve, although there are some initial indications that this may be possible in a larger study. That said, the effect size (\(\eta^2 = 0.249\)) indicates that a study with two cohorts of 121 would be sufficient to show statistical significance\(^{[29]}\). Figure 2 clearly illustrates the general fall in the PANSS total score. The average score for interview 1 was 59.54±16.03, for interview 2 was 54.09±11.97 and for interview 3 (after treatment) was 41.62±9.11. There were improvements in all areas measured by the PANSS, most notably in scores for both positive and negative symptoms.

![Figure 2 PANSS total score of each interview](image)

Time points 1 and 2 are questionnaires or interviews carried out before the course of acupuncture treatment; time point 3 was carried out afterwards. PANSS: the Positive and Negative Syndrome Scale.

3.2.2 Sleep: the PSQI

The PSQI measures 7 factors relating to sleep, these include duration, disturbance, latency (the amount of time it takes to go to sleep), daily dysfunction due to sleepiness, efficiency (the amount of time spent in bed compared with the amount of time asleep), overall quality and the need for medication in order to sleep. This method has been shown to have good reliability and validity in a number of studies\(^{[30, 31, 32]}\).
Again, in this study there was a general trend amongst participants for improvements in sleep (see Figure 3 below). The average score for interview 1 was 8.09 ± 4.20, for interview 2 was 8.00 ± 3.60 and for interview 3 (after treatment) was 6.87 ± 3.60. However, the effect size was low (η² = 0.02), meaning that nearly 20,000 participants would be required in a study in order to gain statistical significance [38]. That said, sleep was not a problem for all participants, and it might be worth focusing on this subgroup to see what benefits there are. The most dramatic improvement seemed to be in the need for medication to help sleep (see Figure 4 below). The average score for interview 1 was 1.40 ± 1.50, for interview 2 was 1.18 ± 1.40 and for interview 3 (after treatment) was 0.25 ± 0.70. Here the effect size was improved (η² = 0.133), so a mere 438 participants would be needed in two sample groups [39].

In all, six participants reported they needed medication to aid sleep in initial interviews, five of whom scored 3 (the highest PSQI score) and one scoring 2. Of these, two did not complete the final questionnaire, but did report improvements in their sleep, including a reduction in need for medication or alcohol to aid sleep. The absence of a rectangle at the third time point is illustrative of a fall in all but one participant needing medication to aid sleep by the end of the study. However, for at least three of the participants there were marked improvements in sleep efficiency, and their scores were reduced to 0, indicating that they no longer needed medication for sleep. Four of the participants who completed the study did not have problems in sleep efficiency, and one seemed to have a marked improvement between the first and second questionnaire (reduction from 2 to 0) which was not corroborated in the subsequent interview regarding quality of life.

3.2.3 Side effects of medication: the SQLS

The SQLS measures common factors affecting the quality of life of those diagnosed with schizophrenia. These are more commonly caused by the medication used to treat the condition and include the categories of Symptoms and Side Effects, Psychosocial, and Motivation and Energy. The SQLS has been shown to have sound reliability and validity in a number of studies [38, 40]. The total scores indicate a general decrease in symptoms of schizophrenia and side effects from antipsychotic medication, as well as concurrent improvements in psychosocial wellbeing, motivation and energy (see Figure 5). The average score for interview 1 was 38.63 ± 14.29, for interview 2 was 41.51 ± 18.36 and for interview 3 (after treatment) was 31.21 ± 21.97. Again, the effect size for the SQLS was low (η² = 0.02). However, many of the side effects that participants complained of were not included in this questionnaire. For example, many of the participants were taking clozapine, and as a result suffered from excess salivation. One of these participants complained of vertigo and unpredictable moments of feeling “high” as if she were “trippering”. Ten participants complained of weight gain, eight of cravings for and/or increased sugar intake and four of problems with bowel movements (three others tended towards diarrhoea or constipation, but did not feel it was a problem), which they all attributed to the medication they were taking, but none of these factors are included in this questionnaire.

3.3 Acupuncture results

Table 2 shows the Chinese medicine diagnoses for the participants in the study at their initial consultation, along with key features of their presentation.

Figure 3 PSQI total score of each interview.

Figure 4 PSQI: the need for medication to improve sleep.
Table 2 (to be continued) Participants’ key features at presentation, diagnoses, and outcomes

<table>
<thead>
<tr>
<th>Patient’s number</th>
<th>Key features</th>
<th>Traditional Chinese medicine diagnosis</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dry cough; shortness of breath on exertion; emphysema; mental restlessness (hears voices); very red tongue with white greasy coating; weak pulse in both cubits</td>
<td>Deficiency of lung and kidney leading to phlegm returned in the lung; kidney failing to receive qi; phlegm heat harassing the mind</td>
<td>Felt more energetic, improved appetite, able to walk further due to improvements in lung function, feeling in feet and legs returned, less anxious, complexion brighter and more animated</td>
</tr>
<tr>
<td>2</td>
<td>Presented with obvious symptoms of a common cold; dry skin on the lips and thumb; some paranoia and mood swings; insomnia; hears voices ‘out of the blue’; fast and rapid exterior pulse; red tongue</td>
<td>Invasion by wind cold; slight liver yin deficiency; phlegm fire harassing the heart</td>
<td>Felt more relaxed and sleeping better; lost to follow up in week 8 of the study</td>
</tr>
<tr>
<td>3</td>
<td>Panic attacks; palpitations; restless and disturbed sleep; feels harassed by voices; visual floaters; red tongue with thick yellow coating; tooth marks</td>
<td>Phlegm heat/fire harassing the mind; blood deficiency of heart and liver</td>
<td>Feeling more relaxed and less bothered by voices, able to travel to appointments on bus, and to remain in the room for the full length of an interview, exercising a little more, weight loss and less craving for sweets</td>
</tr>
<tr>
<td>4</td>
<td>Severe vertigo; agitation and giddiness; a feeling of rising upwards; sees, hears and touches ghosts; dream-disturbed sleep; feels hot; very thirsty; constant urination with some incontinence; very red tongue with yellow coating; fast slippery pulse, weak in both cubits</td>
<td>Liver fire flaming upward with ascendant hyperactivity of liver yang; kidney yin deficiency; insecurity of kidney qi; phlegm fire harassing the mind</td>
<td>Sleeping better, stopped hallucinating at night, vertigo gone, morning bowel movements improved, complexion brighter and more animated, exercising more, weight loss</td>
</tr>
<tr>
<td>5</td>
<td>Deep weak pulse; lumbar tension; if walks more than 50 m, lumbar or flank spasms and tightness with pain; tired after eating; feels full easily; craves sweet foods; abdominal bloating; feeling of something stuck in throat; tongue quivers with center cracked and margins swollen and red; tongue coat is creamy</td>
<td>Kidney deficiency; spleen deficiency with dampness encumbrance; liver qi depression and qi stagnation</td>
<td>Less suspicious of people and began to socialise with work colleagues, reduced alcohol to socially once a month, stopped smoking, weight loss, increased exercise, complexion brighter and more animated, increased mobility in troublesome joints</td>
</tr>
<tr>
<td>6</td>
<td>Dull sallow complexion; tiredness with more energy after exercise; weight gain; replete pulse in bar; tongue with thick coat and thin red margins</td>
<td>Liver qi depression and qi stagnation; spleen deficiency with dampness encumbrance</td>
<td>Withdrew from the study early, however returned to say that whilst he was in treatment he was much more energetic and not sleeping in the day. He realised when he could no longer stay awake in the afternoon anymore.</td>
</tr>
</tbody>
</table>
### Table 2 (continuation)  Participants’ key features at presentation, diagnoses, and outcomes

<table>
<thead>
<tr>
<th>Patient’s number</th>
<th>Key features</th>
<th>Traditional Chinese medicine diagnosis</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Anger, extreme stress and agitation connected to voices; bloating; heartburn; night sweats; feels his core is very hot; stress and muscle tension; stiff spine; grinds teeth</td>
<td>Liver qi invading the spleen and stomach; spleen deficiency with dampness encumbrance; ascendant hyperactivity of liver yang; heart yin deficiency; phlegm-fire harassing the heart</td>
<td>Reduced hallucinations from constant voices to once or twice a day, increased motivation and concentration, able to get out of bed and go to groups regularly where he was now noted to be on time and fully engaged, increased confidence and interest in the future — education and getting a partner</td>
</tr>
<tr>
<td>8</td>
<td>Insomnia with difficulty falling asleep; dry skin, dry eyes; muscle cramps; tiredness; thin tense pulse; desire to sigh; abdominal bloating and gas; low mood, low motivation; tension in shoulders and back; panic attacks</td>
<td>Blood deficiency; qi stagnation; non-interaction between the heart and kidney</td>
<td>Some increase in energy and confidence, increased socialisation including dating for first time in years, complexion brighter and more animated; remained anxious to some extent, and had always struggled with issues around perception of self</td>
</tr>
<tr>
<td>9</td>
<td>Tension in shoulders and calves; restlessness; bloating; tired all the time; loose stools; yellow phlegm; hearing voices; weak, slippery and empty pulse; paddle-shaped tongue with red margins</td>
<td>Liver qi depression and qi stagnation; spleen deficiency with dampness encumbrance</td>
<td>Increased energy and motivation, greatly reduced anxiety, stopped smoking, notably reduced side effects of medication — stopped grimacing and staring in public, shaking reduced, joined the gym, started proceedings to go on training course. Felt very well, he began drinking heavily and took some drugs. Relapsed before treatment period ended.</td>
</tr>
<tr>
<td>10</td>
<td>Anxiety; very ungrounded feeling; overly spirited; lack of vision or purpose in life; vivid dreams; weak lower back; bright red tongue tip; slightly fast, choppy and tense pulse</td>
<td>Heart fire; liver qi depression and qi stagnation; non-interaction between the heart and kidney</td>
<td>Increased energy and motivation — able to get out of bed during the day and engage in activities, stopped drinking, notably reduced side effects of medication — stopped staring in public, increased exercise, began to think about dating again, moved house, increased contact with family. Relapsed some weeks after course of treatment. He had been drinking heavily and became very isolated.</td>
</tr>
<tr>
<td>11</td>
<td>One-sided temporal tension and headaches; menstrual cramps; muscle cramps; sullen manner; dull pale complexion; postural diastasis; constipation with dry stools; feels full easily; low energy; abdominal bloating with gas</td>
<td>Liver qi depression and qi stagnation; liver blood deficiency; spleen qi and stomach yin deficiency</td>
<td>Increased energy and ability to relax, reduced urine output, especially at night, increased sex drive (virtually none previously), weight gain (unintentional — took a holiday during the study and changed diet), reduced smoking, reduced anxiety, reduced muscular pain, decreased suspiciousness and increased socialisation</td>
</tr>
</tbody>
</table>

### 4 Discussion

#### 4.1 General comment on results
Two participants (2 and 9) were lost to follow-up. The first one said he had experienced enormous benefits from the treatment which made him feel relaxed and sleep better, and he became busy with his college life which meant that he was unable to turn up for his acupuncture appointments. The second patient also cited great improvements in terms of anxiety and socialisation, sleeping better and exercising more, but as a result of feeling so well he stopped his medication and then drank heavily and used drugs and consequently relapsed before the end of treatment. A third patient (10) followed a similar pattern but relapsed some weeks after treatment had finished. A fourth participant (6) withdrew from treatment early citing no benefits and finding the needling intolerable; he later returned to report that his energy and sleep had deteriorated since stopping treatment which made him realise that perhaps the acupuncture had had some good effects.

For some of the participants the results of their first and second interviews and questionnaires (conducted prior to commencing the acupuncture treatment) differed, but except for one, this was not statistically different. For that particular participant, there were inconsistencies in her reporting throughout the study and this might be expected with this patient group because of associated features of disorganisation and poor memory\(^{51, 15}\). The general trend was towards improvements in all of the areas examined, but to a lesser degree in the SOLS. This might be attributed to the need to include, in the parameters measured by the SOLS, the side effects experienced with the newer antipsychotics. What the participants told the acupuncturists was generally consistent with research interviews, and the acupuncturists were surprised at how open patients were about their diagnosis of schizophrenia, symptoms and side effects. Many of the participants withheld information about themselves until later in the study, when they felt they knew the acupuncturists and researcher better. For example, one participant changed his report of how much he drank between

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\(^{51}\) 51

\(^{15}\) 15
interviews one and two, but in his final interview conceded to having been drinking heavily every day, including before work.

The study was conducted in the spring and the acupuncturists remarked that it might have been easier to get positive results because of the season, with the longer days and warmer weather having a generally positive effect on people’s moods and activity patterns. It might, therefore, have been expected that the participants normally experienced some improvement at this time of year. However, all of the participants denied having any particular pattern of wellness or illness associated with seasonal change; furthermore examination of their medical notes confirmed this.

It is worth noting that the two participants (9 and 10) who relapsed were the most disengaged from services and had both suffered traumas with which they were still struggling to cope. It is also important to say that, as participants felt better, their contact with services increased. They wanted more support and help to find training or employment, uptake of the therapies on offer, or help to find a new partner.

4.2 Triangulation of data A number of tools were used in this study and the purpose was to explore whether changes occurred and what changes there might be for those suffering from schizophrenia if treated with acupuncture alongside normal treatment. For acupuncture, there was an adaptation of the STRICTA protocol, which enabled the collection of data around diagnoses, treatment and outcomes. Examination of the acupuncturists’ findings show some similarities in diagnosis (e.g. liver qi depression and qi stagnation in 5 participants), but many had other symptoms and responded well to a treatment approach that was aimed at their particular conditions. A good advantage of the STRICTA protocol was its usefulness in identifying physical symptoms of participants. These are often neglected in psychiatry and even when they are not, there is some struggle to tackle or offset the undesirable side effects of medication against the benefits of i.e. [5, 51]. Moreover, use of the STRICTA enabled the identification of physical and other psychological changes (such as urine and bowel problems, sexual problems and muscular problems) not accounted for in the PANSS, the PSQI or the SQLS. Information gathered by the acupuncturists also helped to confirm the findings of the researcher during both the PANSS and Quality of Life interviews. This was particularly useful where there were inconsistencies in what participants reported, and it was notable that many of the participants began to divulge more intimate or potentially embarrassing information as the study progressed. This was both to the researcher and the acupuncturists.

Case studies and mixed methods (use of quantitative and qualitative approaches within the same study) offer richer information, and provide the opportunity to address questions that arise through both the quantitative and qualitative approaches [50]. However, this type of design has the potential for bias [51]. As data are gathered, the researcher may change the research approach, or use data gathered in a way that was not originally intended [54, 55]. Other problems might arise from the sheer quantity of data that are gathered in these studies and the fact that it is not linear [50, 53, 55], the difficulties in triangulating quantitative and qualitative data that are not obviously connected, and in prioritising sets of data and how they are to be connected to one another [51]. For example, it is not immediately obvious what might be compared between the PANSS and the STRICTA assessments. Examination of the data here shows that participant assessment under STRICTA has identified anger, tension, hallucinations and anxiety in participants, all categories included in the PANSS. This is important, because it illustrates that participants felt able to discuss these factors with the acupuncturists, and the acupuncturist data corroborates the results of the PANSS interviews.

A second significant example of the findings through triangulation of data can be found in the comparison of the results from the PSQI [20] and data from the quality of life interviews. The PSQI has been extensively used and shown to have sound reliability and validity in a number of studies [41, 49, 50, 54]. The participants were also asked about their energy levels and daily routine in the qualitative interview administered by the researcher. Many of the participants said that they got up around 9 or 10 in the morning on their questionnaires. However, when questioned, the findings differed. One patient simply could not get out of bed until 5 pm. Another remained in bed until 2 pm and then he would sleep on the sofa. Another would get up at 2 pm for a few hours and be back in bed between 5 pm and 7 pm. Although the PSQI provided statistical data, the data were different to that of the participants’ own accounts of the time spent sleeping or trying to sleep.

5 Conclusion

This study indicates that people with a diagnosis of schizophrenia who are being treated in the community can gain further improvements of symptoms of schizophrenia, side effects of antipsychotic medication and other physical problems that are often associated with schizophrenia through the use of acupuncture. The use of a mixed methods approach has helped discover what these symptoms and improvements are and what tools might be helpful in future studies. The PANSS and the STRICTA tools have reflected what participants have told the researcher through qualitative approaches. Future studies might combine with an enhanced questionnaire regarding the side effects of medica-
tion, weight, diet, physical exercise and sleeping habits. The study has also highlighted the possibility that those who recover through the use of acupuncture may become more vulnerable to breakdown. This risk is well known in psychiatry and people with a diagnosis of schizophrenia are known to be more vulnerable when they recover from a psychotic episode[15]. The lesson here may be that there needs to be support immediately available for participants once they begin to recover and want to engage with improving their quality of life. The experience of this study is that such support is there, but that it is not as readily accessible as it needs to be.

6 Competing interests

The authors declare that they have no competing interests.

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针刺作为辅助手段治疗精神分裂症的探索性病例研究

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目的：探索个体针刺疗法作为常规治疗的辅助手段在精神分裂症患者中的效果，采用探索性病例研究的方法，使用定量和定性评价工具，以便能够对针刺治疗此类患者的确切疗效作出科学评价，并对未来采用针刺治疗此类患者的试验设计提供方法学建议。

方法：共纳入11例精神分裂症患者，在予以10周的针刺治疗前，治疗过程中及治疗后分别使用多种有效的定量和定性评价工具对患者进行多方面的评价。这些评价手段包括对针刺治疗、全科医生及精神科医生病历的整理回顾。分析定性资料以评价受试者向研究者及其临床医生和护理人员报告的内容的可靠性。

结果：11名受试者中共有8名完成了1个疗程的针刺治疗，全部11名受试者都报告了针刺治疗的积极作用，包括精神分裂症症状的改善，缓解药物的副作用，对精力、内在动机、睡眠、成瘾症状及其他身体机能的促进作用。但是，受试者向研究者和针刺医生报告的信息在不同治疗阶段有一定差别，且往往不一致；在研究结束后，受试者向研究者报告了更多的信息。

结论：本研究表明，在常规疗法之外辅以针刺治疗能够给精神分裂症病人带来一定益处。对数据的三角测量表明了受试者报告内容的某些不一致性，而这些可以通过多种研究方法的混合使用予以克服。通过对数据的比较，推荐在将来研究设计中使用阳性与阴性症状量表、针刺临床试验干预措施报告标准以及在问卷中增加对药物副作用、运动、睡眠以及日常作息的调查。在将来研究中还应充分考虑到，恢复期患者容易复发，应该让他们可以方便地获得帮助。

关键词：精神分裂症；针刺；阳性与阴性症状量表；STRICTA；研究设计