Attitudes to Stem Cell Therapy Among Ischemic Stroke Survivors in the Lund Stroke Recovery Study

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Preclinical studies suggest that stem cell therapy (SCT) may improve poststroke recovery, and clinical trials investigating safety are ongoing. However, knowledge about patients’ attitudes to SCT in stroke is limited. We evaluated the knowledge and attitudes to this therapeutic approach as well as possible factors influencing this among stroke patients potentially suitable for SCT. Consecutive first-ever acute ischemic stroke patients aged 20–75 years with NIH stroke scale scores 1–18 were included. Exclusion criteria were severe comorbidities or infratentorial stroke. Clinical follow-up after 3–5 years assessed severity of residual stroke symptoms, cognitive function, functional status, patient-reported outcome, and comorbidity, and after receiving standardized information, the participants also completed an eight-item questionnaire on knowledge and attitudes about SCT. The relationships between clinical variables and positive attitude to SCT were assessed with logistic regression analyses. Of 108 patients included at baseline, 84 participated at follow-up and completed the questionnaire. In total, 12% had prior knowledge of SCT. When informed, 63% were positive toward it and 36% reported willingness to participate in SCT trials. Only 5%–8% expressed ethical considerations regarding different stem cell sources. Positive attitudes to SCT were associated with male gender (OR: 3.74; 95% CI: 1.45–9.61; \( P < 0.01 \)) and better patient-reported outcome (OR: 1.02; 95% CI: 1.00–1.04; \( P < 0.05 \)). In conclusion, stroke patients had limited prior knowledge of SCT, yet attitudes were positive among the majority after receiving standardized and neutral information. Gender and degree of stroke recovery may influence attitudes to SCT, indicating a need for targeted information to improve knowledge about SCT.

Keywords: stroke, stem cell therapy, patient attitude

Introduction

STEM CELL THERAPY (SCT) holds considerable potential as a novel therapeutic approach to promote functional recovery after stroke. Experimental studies have provided preclinical evidence that SCT, either with neural or mesenchymal stem cells, can improve functional recovery in animal stroke models [1,2]. The mechanisms of action of the stem cells include trophic effects, immunomodulation, neuroprotection, angiogenesis, and possibly also neuronal replacement [1–3]. Several clinical stroke trials with SCT are currently ongoing, primarily investigating safety in small patient samples, but the efficacy of SCT in larger numbers of stroke patients is yet to be demonstrated [2,4,5]. Along with the scientific challenges of translating the preclinical findings to the clinical setting [6], it is also important to consider stroke patients’ knowledge and attitudes about SCT as these factors may have important implications for the possible clinical implementation of SCT. For any novel potential treatment, and especially SCT, which has raised sharp ethical and political controversies [7], information about the knowledge and attitudes of patients is important for the planning of clinical trials, design of patient education programs, and ultimately the implementation of treatment strategies.

There is a scarcity of studies with regard to stroke patients’ knowledge and attitudes about SCT. In a previous Korean study on chronic ischemic stroke patients’ perspectives and expectations about SCT, 46% of the patients wished to receive SCT despite unknown side effects [8]. The study also reported that many stroke patients had unrealistic expectations regarding the benefits of SCT and media outlets such as television and radio were the major sources of patient information [8]. Furthermore, male gender, longer disease duration, higher degree of disability and prior knowledge about stem cells were also identified as independent factors influencing the patients’ acceptance of SCT [8]. However, the
follow-up procedure included a general chronic stroke population, and not solely patients who would likely be eligible for SCT. In other studies with different patient groups such as patients with Parkinson’s disease, many patients displayed misconstrued knowledge or were unaware of SCT [9]. Moreover, autologous stem cells seem to be preferred to allogenic cells by patients with burn injuries, Parkinson’s disease, and diabetes mellitus, as reported in a study on attitudes to progenitor cell source [10].

As the literature on stroke patients’ knowledge and attitudes about SCT is limited, we examined a selected group of ischemic stroke patients potentially suitable for SCT, assessing their knowledge and attitudes to such therapy. We also analyzed factors possibly influencing the patients’ attitudes about SCT, including their willingness to undergo SCT through intracerebral transplantation and participate in clinical SCT trials.

Materials and Methods

Sample

This study is based on the cohort of the Lund Stroke Recovery Study (LSRS) on functional recovery and long-term effects after stroke. Details of the LSRS have been reported earlier [11,12]. In brief, the original study participants in LSRS (n = 108) were selected on the basis that they would be potentially suitable for SCT, and they were recruited in the acute phase after first-ever ischemic stroke from a consecutive series of patients admitted to Skåne University Hospital in Lund, Sweden, during 2009–2011. Inclusion criteria were as follows: age 20–75 years, National Institutes of Health Stroke Scale (NIHSS) score of 1–18 on day 2–4 after stroke onset, diffusion-weighted magnetic resonance imaging (MRI) performed within 4 days of stroke onset, and written informed consent. Exclusion criteria were as follows: symptoms or acute computed tomography findings indicating infratentorial infarction, severe comitant disease, or contraindications to MRI.

All procedures performed in this study were in accordance with the ethical standards of the Regional Ethical Review Board in Lund, Sweden (registration numbers 2009/156 and 2014/298), and with the 1964 Helsinki Declaration and its later amendments.

Follow-up procedure

A clinical follow-up examination was performed by a physician for all participating stroke survivors at 3–5 years poststroke. The follow-up examinations were performed at the outpatient clinic of the Department of Neurology and Rehabilitation Medicine at Skåne University Hospital. If stroke survivors were unable to participate in the follow-up session at the outpatient clinic, they were offered follow-up through home visit.

SCT questionnaire

Patients who participated in the clinical follow-up examination were presented an information sheet on stroke and SCT written by the authors (Supplementary Data S1; Supplementary Data are available online at www.liebertpub.com/scd), and thereafter answered an eight-part multiple-choice questionnaire regarding their prior knowledge and attitudes about SCT (Supplementary Data S2).

Other assessments

Other assessments at the clinical follow-up examination included the following: NIHSS (score 0–42) as a measure of stroke severity [13]; Montreal Cognitive Assessment (MoCA, score 0–30) as a measure of cognitive function [14]; modified Rankin Scale (mRS, score 0–5) as a measure of overall disability [15]; and Stroke Impact Scale version 2.0 (SIS, aggregated scores ranging from 0 to 100) as a measure of patient-reported outcome and health-related quality of life [16]. For this study, we analyzed the SIS domain regarding stroke recovery (question 9), in which patients were asked to quantify their overall stroke recovery from 0 (indicating “no recovery”) to 100 (indicating “full recovery”). In addition, the burden of comorbid diseases was assessed using the Charlson comorbidity index (CCI, score 0–29) [17]. Also, information regarding the patients’ educational attainment was registered at the clinical follow-up by asking patients of their educational background, including number of years of formal education.

Statistical analysis

Factors that may influence patients’ attitudes to SCT were assessed using univariate and multivariate logistic regression analyses. We selected the following independent variables to be included in the logistic regression analyses: age, gender, education level (number of years of formal education), cognitive function (MoCA score), comorbidities (CCI score), severity of stroke symptoms (NIHSS score), recovery of stroke symptoms (ΔNIHSS = NIHSSbaseline – NIHSSfollow-up), patient-reported stroke recovery (SIS question 9), and prior knowledge of SCT. The dependent variables were the patients’ responses to the SCT questionnaire regarding the following: (a) their attitude to SCT (“positive” vs. “negative” or “do not know/do not wish to answer”), (b) their willingness to undergo SCT through intracerebral transplantation (“yes” vs. “no” or “do not know/do not wish to answer”), and (c) their willingness to participate in clinical SCT trials (“yes” vs. “no” or “do not know/do not wish to answer”).

We also performed post hoc analyses using univariate and multivariate logistic regression models to examine possible factors that may be associated with the patients’ tendency to respond with the specific answer “do not know/do not wish to answer” to the questions of the SCT questionnaire. In these analyses, the independent variables were as follows: age, gender, number of years of formal education, MoCA score, CCI score, NIHSS score, and ΔNIHSS. The dependent variables were the patients’ responses (“positive/negative” or “yes/no”) versus nonresponse (“do not know/do not wish to answer”) to the questions regarding the following: (a) their attitude to SCT, (b) their willingness to undergo SCT through intracerebral transplantation, (c) their willingness to participate in clinical SCT trials, as well as (d) their ethical considerations about various stem cell sources.

P-values <0.05 were considered statistically significant. The IBM SPSS software (version 22, released 2013; IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.) was used for statistical calculations.

Results

In total, 108 stroke patients were included at baseline, of which 11 (10%) patients were deceased at the time of
clinical follow-up and 13 (12%) patients were lost to follow-up [12]. Hence, 84 (78%) patients participated in the clinical follow-up and completed the SCT questionnaire. The median time from stroke onset to follow-up was 4.6 years (range 3.5–5.7). The demographic and clinical characteristics of the participating stroke patients at follow-up are presented in Table 1.

**SCT questionnaire responses**

In all, 10 (12%) patients reported that they had previously heard of SCT. The main information sources about SCT (several patients had obtained information from multiple sources) were television or radio (n = 7), newspapers or magazines (n = 5), physicians (n = 2), and the internet (n = 1).

In total, 53 (63%) patients reported a positive attitude to SCT. Moreover, 26 (31%) patients reported that they could consider receiving SCT through intracerebral transplantation, while 40 (48%) patients could consider receiving SCT through systemic administration. The SCT questionnaire responses of the stroke patients are presented in detail in Table 2.

A total of five (6%) patients expressed ethical considerations/moral doubts about SCT with adult stem cells, seven (8%) patients about SCT with fetal stem cells, six (7%) patients about SCT with embryonic stem cells, and four (5%) patients reported ethical considerations/moral doubts about SCT with induced pluripotent stem cells (Table 2).

Furthermore, the stroke patients most frequently wished to improve impaired motor functions (38%) and deficits in cognitive functions (32%) with SCT, if the treatment had been available (Table 2). The proportion of patients who responded “do not know/do not wish to answer” varied between 16% and 56% for the different questions of the SCT questionnaire. The questions with the highest frequency of “do not know/do not wish to answer” responses were related to the patients’ self-perceived need of SCT (56%), willingness to undergo SCT through intracerebral transplantation (41%) or through systemic administration (41%), as well as ethical considerations regarding different stem cell sources (42%–44%) (Table 2).

**Factors influencing attitudes to SCT**

Factors associated with positive attitudes to SCT were male gender (crude OR: 3.74; 95% CI: 1.45–9.61; P < 0.01) and a better patient-reported outcome as evaluated by SIS (crude OR: 1.02; 95% CI: 1.00–1.04; P < 0.05). There was also a trend toward a higher degree of stroke recovery, as measured with ∆NIHSS, being associated with positive attitudes to SCT (crude OR: 1.19; 95% CI: 0.99–1.43; P = 0.058) (Table 3).

In addition, male gender was associated with willingness to undergo SCT through intracerebral transplantation (crude OR: 6.68; 95% CI: 1.80–24.73; P < 0.01), as well as willingness to participate in clinical SCT trials (crude OR: 5.39; 95% CI: 1.80–16.15; P < 0.01). Likewise, a higher degree of stroke recovery, as measured with ∆NIHSS, was associated with willingness to undergo SCT through intracerebral transplantation (crude OR: 1.26; 95% CI: 1.03–1.54; P < 0.05) and willingness to participate in clinical SCT trials (crude OR: 1.32; 95% CI: 1.07–1.62; P < 0.01) (Table 3).

The abovementioned associations were confirmed when using multivariate logistic regression analyses adjusting for age, gender, education level, MoCA, CCI, NIHSS at follow-up, ∆NIHSS, SIS recovery, and prior knowledge of stem cells (Table 3).

Moreover, there was an association between lower degree of stroke recovery and the tendency to respond “do not know/do not wish to answer” to the questions regarding willingness to undergo SCT through intracerebral transplantation (crude OR: 0.78; 95% CI: 0.64–0.95; P < 0.05) and willingness to participate in clinical SCT trials (crude OR: 0.79; 95% CI: 0.65–0.97; P < 0.05) (Supplementary Table S1). Similarly, there was also a possible trend toward female gender and lower MoCA scores being associated with the tendency to respond “do not know/do not wish to answer” to the questions regarding ethical considerations about stem cell sources (Supplementary Table S2).

**Discussion**

This is the first study to report the knowledge and attitudes about SCT among a selected group of ischemic stroke patients potentially suitable for such therapy. We found that the stroke patients had limited prior knowledge of SCT (12%), yet attitudes to SCT were positive among the majority of them (63%) after receiving standardized and neutral information. Male gender and higher degree of stroke recovery were associated with positive attitudes toward SCT, as well as with willingness to undergo SCT through intracerebral transplantation and participate in clinical SCT trials.

In our study, only 12% of the patients reported that they had previously heard of SCT for stroke. This is a lower proportion than reported in a previous Korean study where 48% had heard of stem cells and 35% had knowledge of

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**Table 1. Demographic and Clinical Characteristics of Study Participants at Follow-up**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study participants (n = 84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, n (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>54 (64)</td>
</tr>
<tr>
<td>Female</td>
<td>30 (36)</td>
</tr>
<tr>
<td>Age*, median (IQR)</td>
<td>68 (62–73)</td>
</tr>
<tr>
<td>Education level, n (%)</td>
<td></td>
</tr>
<tr>
<td>Grade school (0–9 years)</td>
<td>35 (42)</td>
</tr>
<tr>
<td>High school (10–12 years)</td>
<td>23 (27)</td>
</tr>
<tr>
<td>College and/or university (&gt;12 years)</td>
<td>26 (31)</td>
</tr>
<tr>
<td>MoCA score, median (IQR)</td>
<td>25 (21–27)</td>
</tr>
<tr>
<td>NIHSS score, median (IQR)</td>
<td>0 (0–2)</td>
</tr>
<tr>
<td>CCI score, median (IQR)</td>
<td>2 (1–2)</td>
</tr>
<tr>
<td>Modified rankin scale, n (%)</td>
<td></td>
</tr>
<tr>
<td>No–slight disability (mRS = 0–2)</td>
<td>76 (91)</td>
</tr>
<tr>
<td>Moderate disability (mRS = 3)</td>
<td>5 (6)</td>
</tr>
<tr>
<td>Severe disability (mRS = 4–5)</td>
<td>3 (4)</td>
</tr>
</tbody>
</table>

*The median age among the male participants was 68 years (range 33–79), and among female participants the median age was 70 years (range 41–80).

mRS, modified rankin scale; NIHSS, National Institutes of Health Stroke Scale; MoCA, Montreal Cognitive Assessment; CCI, Charlson Comorbidity Index.
ongoing clinical trials of SCT in stroke [8]. In both our study and the Korean study, traditional media outlets such as television and radio were the most common sources of information among those who had previously heard of SCT. The discrepancy in the proportion of stroke patients with prior knowledge of SCT in the two studies may possibly reflect a difference in media coverage about SCT in the two respective countries. There may also be cultural differences in public interest with regard to different novel medical treatments and research awareness in general. For example, it would be interesting to compare patients’ knowledge and attitudes to SCT and other proposed treatments for stroke in the chronic phase such as constraint-induced movement therapy, transcranial direct current stimulation, or various pharmacological interventions. [18]

In a recent cross-sectional survey of stroke survivors participating in stroke registries in Sweden and five other European countries, overall research awareness was limited among respondents including limited active seeking of information about stroke research [19]. Nevertheless, a majority of the stroke patients (63%) in our study expressed a positive attitude toward SCT after receiving standardized and neutral information on the subject. Since only 12% of the patients had heard of SCT before the follow-up visit, the patients’ information came primarily from the information sheet that preceded the questionnaire. To examine whether the information attained from different sources influences the attitudes toward SCT was beyond the scope of this study. However, previous studies have reported that patients generally consider information from physicians as more reliable compared to other sources [8]. Altogether, the limited prior knowledge about SCT among the stroke patients and their positive attitude toward SCT after receiving standardized and neutral information indicate that researchers and healthcare professionals need to develop improved strategies to raise public awareness of current SCT research [20].

We found that patients with prior knowledge of SCT were not significantly more positive or negative toward SCT when compared to other patients, which raises the question whether improved knowledge of a therapy may influence attitudes toward it. It should be noted, although, that only 10 stroke patients in our cohort had prior knowledge of SCT, and therefore this analysis may have been underpowered. To our knowledge, no other study has established a clear relationship between patients’ prior knowledge of SCT and their attitudes toward receiving such therapy.

Our study shows that male gender was associated with a positive attitude to SCT, as well as willingness to obtain SCT through intracerebral transplantation. Similar results were reported in the aforementioned Korean study, in which male gender was associated with a positive attitude to SCT [8]. It is noteworthy that we also found that male gender was associated with willingness to participate in clinical SCT trials. Gender bias is a well-described issue in the recruitment of participants for clinical trials [21,22]. Our findings suggest that a possible factor in the difficulties in attaining gender equivalence in clinical trials may be related to a difference between the genders with regard to the willingness to participate in such trials. This may be of importance when recruiting patients for future clinical trials of SCT in stroke, as it may indicate a potential difficulty in including

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**Table 2. SCT Questionnaire Responses of Study Participants**

<table>
<thead>
<tr>
<th>Question</th>
<th>Study participants (n=84)</th>
<th>Yes/positive, n (%)</th>
<th>No/negative, n (%)</th>
<th>Do not know/do not wish to answer, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of SCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previously heard of SCT for stroke</td>
<td>10 (12)</td>
<td>61 (73)</td>
<td>13 (16)</td>
<td></td>
</tr>
<tr>
<td>Attitudes to SCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude toward SCT for stroke</td>
<td>53 (63)</td>
<td>3 (4)</td>
<td>28 (33)</td>
<td></td>
</tr>
<tr>
<td>Willing to undergo SCT by intracerebral transplantation</td>
<td>26 (31)</td>
<td>24 (29)</td>
<td>34 (41)</td>
<td></td>
</tr>
<tr>
<td>Willing to undergo SCT by systemic administration</td>
<td>40 (48)</td>
<td>10 (12)</td>
<td>34 (41)</td>
<td></td>
</tr>
<tr>
<td>Willing to participate in a clinical stroke trial with SCT</td>
<td>33 (39)</td>
<td>21 (25)</td>
<td>30 (36)</td>
<td></td>
</tr>
<tr>
<td>Ethical considerations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude toward stem cell research/SCT with the following:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult stem cells</td>
<td>44 (52)</td>
<td>5 (6)</td>
<td>35 (42)</td>
<td></td>
</tr>
<tr>
<td>Fetal stem cells</td>
<td>40 (48)</td>
<td>7 (8)</td>
<td>37 (44)</td>
<td></td>
</tr>
<tr>
<td>Embryonic stem cells</td>
<td>41 (49)</td>
<td>6 (7)</td>
<td>37 (44)</td>
<td></td>
</tr>
<tr>
<td>Induced pluripotent stem cells</td>
<td>44 (52)</td>
<td>4 (5)</td>
<td>36 (43)</td>
<td></td>
</tr>
<tr>
<td>Need of SCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In need of SCT</td>
<td>20 (24)</td>
<td>17 (20)</td>
<td>47 (56)</td>
<td></td>
</tr>
<tr>
<td>Impairments in most need of SCT for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paralysis/weakness</td>
<td>32 (38)</td>
<td>19 (23)</td>
<td>33 (39)</td>
<td></td>
</tr>
<tr>
<td>Loss of sensation/numbness</td>
<td>16 (19)</td>
<td>35 (42)</td>
<td>33 (39)</td>
<td></td>
</tr>
<tr>
<td>Speech difficulties</td>
<td>22 (26)</td>
<td>29 (35)</td>
<td>33 (39)</td>
<td></td>
</tr>
<tr>
<td>Vision problems</td>
<td>11 (13)</td>
<td>40 (48)</td>
<td>33 (39)</td>
<td></td>
</tr>
<tr>
<td>Difficulty with memory and thinking ability</td>
<td>27 (32)</td>
<td>24 (29)</td>
<td>33 (39)</td>
<td></td>
</tr>
<tr>
<td>Mood problems</td>
<td>18 (21)</td>
<td>33 (39)</td>
<td>33 (39)</td>
<td></td>
</tr>
</tbody>
</table>

SCT, stem cell therapy.
population-representative samples of women, and possibly a need for targeted education programs on SCT.

A higher degree of stroke recovery, either measured objectively (ΔNIHSS) or subjectively (SIS), was independently associated with a positive attitude to SCT as well as with willingness to participate in clinical SCT trials. This somewhat contradicts findings of prior studies, in which a poor functional outcome (as evaluated with mRS) was associated with willingness to receive SCT [8]. Another study on acceptability of SCT among pregnant women has similarly reported an association between acceptability of SCT and disease severity [23]. However, the findings of these studies concern static measurements of disease burden and not a recovery process. One possible explanation as to why stroke patients with a higher degree of recovery might have more positive attitudes toward SCT could be that a good recovery may instill trust and more positive views of healthcare in general. Related to this issue, it has previously been reported that female gender is independently associated with poor functional recovery after stroke [24], as well as unmet rehabilitation needs [25], which in turn might partly explain our findings regarding the gender differences in attitudes toward SCT.

We found that impaired motor functions as well as impaired cognitive functions were the two major categories of impairments that stroke patients most frequently reported that they would want SCT to improve. This information might be valuable for future clinical SCT trials, since patients’ attitudes to SCT and willingness to receive such therapy may also be related to deficits in specific neurological domains. Besides, from the perspective of SCT, it is essential to target impairments of subjective importance for patients and which may influence their health-related quality of life [12].

Notably, the frequency of stroke patients that expressed ethical considerations about SCT was relatively low in our study, and there were no major differences in the proportions of patients that expressed ethical considerations concerning the different stem cell sources. Prior studies have shown that the different available stem cell sources are associated with varying degrees of controversy [7]. In particular, the use of stem cells from fetal tissue has been controversial because it is associated with abortion [7]. Similarly, embryonic stem cells are ethically controversial as they involve the destruction of embryos [7]. However, our findings with a low proportion of patients expressing ethical
considerations may partly be related to the fact that Sweden is a rather secularized society, whereby many ethical issues regarding SCT might not be as pertinent for nonreligious patients [26]. Although, it might also indicate that the patients in our study had not fully understood the information preceding the questionnaire and/or the subsequent questions. This could in turn be due to how the information and/or questions were worded, and also possibly be related to the cognitive function of the patients. In fact, there was a trend toward impaired cognitive functioning (as measured with MoCA) being associated with the tendency to respond “do not know/do not wish to answer” to the questions regarding ethical considerations about SCT. This highlights the importance of giving adequate and adapted information about SCT, also taking into account that many stroke patients have cognitive deficits [27,28].

Several limitations of our study should be recognized. The case ascertainment was based on strict patient selection criteria aiming for patients who were potentially suitable for SCT, but which also resulted in a relatively small study sample. The patients answered the questionnaire 3–5 years after stroke onset and some of the questions were hypothetical. It seems possible that the expressed opinions and attitudes may differ from those at another time point postinsult or in a future situation in which a clinically effective SCT was available. Furthermore, the patient sample was recruited from Skåne University Hospital in Lund, Sweden, that has an uptake area in which the population has an overall higher education level than the general Swedish population [29], which may have influenced the results. Also, many included patients had mild stroke symptoms with low overall NIHSS scores. It is currently unclear if such patients will be realistic candidates for SCT. However, even low overall NIHSS scores may represent significant disability causing lowered health-related quality of life. Another limitation is the high proportion of patients that responded “do not know/do not wish to answer” to the questions of the SCT questionnaire. These answers are difficult to interpret accurately as they may, for instance, include patients who have not understood the information/questions adequately or patients who do not wish to respond on grounds of finding the posed questions offensive. We found a trend that female gender and reduced cognitive function were possibly associated with the tendency to respond “do not know/do not wish to answer” to the questions on ethical considerations regarding the stem cell sources. Also, a low degree of stroke recovery seemed to be associated with not responding to the questions concerning willingness to undergo SCT through intracerebral transplantation or to participate in clinical SCT trials.

In conclusion, our study demonstrates that ischemic stroke patients potentially suitable for SCT had limited prior knowledge of such therapy, yet a majority expressed positive attitudes toward it after receiving standardized and neutral information. Furthermore, male gender and higher degree of stroke recovery were associated with more positive attitudes to SCT, as well as willingness to participate in clinical SCT trials. Our findings suggest that improved and targeted patient education programs may be valuable to raise awareness about SCT and possibly facilitate recruitment to clinical SCT trials in stroke.

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Author Disclosure Statement
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