INTRODUCTION

Ketamine is a N-methyl-D-aspartic acid receptor antagonist that was first found to have effects in humans almost 50 years ago [1]. The drug has shown to have both anesthetizing and analgesic properties. Many studies have looked at the effectiveness of ketamine’s analgesic properties in regards to chronic neuropathic pain [2-11]. Neuropathic pain, as defined by Coulson et al., is initiated by damage to the somatosensory nervous system causing spontaneous pain and amplified response to noxious and innocuous stimuli [12]. Ketamine’s use is seen with various causes due to the varied effects caused by the drug. In those with few or tolerable side effects, ketamine does successfully decrease pain and allodynia. This includes many different types of neuropathic pain ranging from central neuropathic pain to phantom limb pain. It has also been shown that both intravenous and oral ketamine have some benefit in the treatment of depression [13, 14]. However, it has yet to be shown what impact successful ketamine administration has on a patient’s quality of life (QOL) as a whole. The purpose of this study was to assess the effect of outpatient ketamine infusions on QOL outcome measurements in patients with chronic pain.

MATERIALS AND METHODS

Patients in the George Washington Spine Center with chronic neuropathic pain syndromes were asked to complete a survey (Figure 1). The survey asked patients the extent of the impact of their chronic pain on aspects of their QOL (overall daily pain score, general activity, walking, work, relationship with others, sleep, and enjoyment of life). A scale of zero to ten was placed next to QOLs. A score of zero would indicate that their chronic pain had no impact on that specific QOL. However, a score of ten would indicate severe activity, walking, work, relationship with others, sleep, and enjoyment of life). A scale of zero to ten was placed next to QOLs. A score of zero would indicate that their chronic pain had no impact on that specific QOL. However, a score of ten would indicate severe impact. The patients then underwent ketamine infusion in the outpatient surgery center post-operative care unit. Patients were then asked to follow up in the clinic two to four weeks after receiving ketamine infusion. At follow up, the patients were then asked to complete the survey once again. Four predictors (age, sex, race, and pre-treatment score) were also used in order to evaluate any change on QOL due to patient demographics. Overall change in QOL both prior to treatment with ketamine infusion and after administration were evaluated. In order to compare pre- and post-scores, a paired tailed t-tests was used.

RESULTS

51 patients received three consecutive outpatient ketamine infusions and completed both the pre-injection (baseline) and post- infusion (follow-up clinic visit) surveys. The mean average pain score decreased from 7.00 to 6.06 post infusion and was statistically significant (p=0.065). Pain and enjoyment of life were also found to be significantly improved with p-values of 0.033 and 0.016 respectively. There was no statistical significant change in the impact of chronic pain on general activity, mood, walking, work, and ability to make it to other infusions. Age was also found to be a predictor for the impact of chronic pain on patients’ ability to walk and to work. Pain had less of an impact in the ability to walk or work in younger patients than older patients. A score of ten would indicate severe activity, walking, work, relationship with others, sleep, and enjoyment of life). A scale of zero to ten was placed next to QOLs. A score of zero would indicate that their chronic pain had no impact on that specific QOL. However, a score of ten would indicate severe impact. The patients then underwent ketamine infusion in the outpatient surgery center post-operative care unit. Patients were then asked to follow up in the clinic two to four weeks after receiving ketamine infusion. At follow up, the patients were then asked to complete the survey once again. Four predictors (age, sex, race, and pre-treatment score) were also used in order to evaluate any change on QOL due to patient demographics. Overall change in QOL both prior to treatment with ketamine infusion and after administration were evaluated. In order to compare pre- and post-scores, a paired tailed t-tests was used.

TABLE 1: Change in QOL items before and after administration of ketamine infusion. Bolded item represents significant improvement from pre to post (P<0.05)

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre</th>
<th>Post</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Activity</td>
<td>7.63±2.44</td>
<td>6.89±2.91</td>
<td>0.065</td>
</tr>
<tr>
<td>Mood</td>
<td>7.51±2.45</td>
<td>6.94±2.90</td>
<td>0.11</td>
</tr>
<tr>
<td>Walking</td>
<td>6.72±3.17</td>
<td>6.31±3.57</td>
<td>0.48</td>
</tr>
<tr>
<td>Work</td>
<td>7.44±3.12</td>
<td>7.08±3.79</td>
<td>0.59</td>
</tr>
<tr>
<td>Sleep</td>
<td>6.33±2.70</td>
<td>6.44±3.21</td>
<td>0.61</td>
</tr>
<tr>
<td>Enjoyment</td>
<td>7.02±2.26</td>
<td>6.81±2.98</td>
<td>0.62</td>
</tr>
</tbody>
</table>

DISCUSSION AND CONCLUSION

This study shows that ketamine infusion not only leads to a reduction of pain but an improvement in other aspects of QOL, specifically sleep and enjoyment of life. When evaluating demographics, results showed that age only played a substantial role in older patients receiving more benefit from ketamine infusions, specifically in relationship to their ability to walk and work. However, when discussing demographics as a whole, it was found that two or more of the specific predictors (age, sex, race, and pre-treatment score), did in fact play a role in regards to a patient’s general activity, mood, walking ability, and working ability. Other patients were more likely to experience an improvement in their walking ability. This could be explained by the fact that younger patients were less likely to have impairment of their ability to walk.

Our findings are consistent with previous studies that patients with chronic pain syndromes experience an improvement in their pain. Our patients also did not show significant improvement in their mood at the two-week follow-up. Long lasting improvement of depressive moods with single dose ketamine infusions has not been shown in previous studies. It is possible that the window to observe the benefit of ketamine to patient mood may have been missed due to our longer length of follow up. It is also important to note that we did not investigate whether our patients had actually had a diagnosis of mood disorder. However lower QOL score for mood appears to be associated with better response to ketamine infusions.

Our study shows new insight into other aspects of outcome measurements and suggests that ketamine infusions may improve functional capabilities in patients with chronic pain. Our next step is to have a larger number of patients participate in the study. Given that our current study analyzes patient outcomes after one round of ketamine infusion, we plan to pursue the effect repeat ketamine infusions (maintenance ketamine) would have for patients with chronic pain.

REFERENCES