Awareness of interventional radiology treatment options for chronic venous insufficiency in Saudi Arabia

Meshael Alreshidi, Mohammad Altraifi, Aljoharah Alwajaan, Nouf Alghris, Amirah Alshammari, Elaf Altebainawi, Afnan Alshammari, Saleh Alammari, Ibrahim Alrashidi

1Department of Radiology, King Abdulaziz Medical City, Riyadh, Saudi Arabia
2College of Medicine, University of Hail, Hail, Saudi Arabia
3Department of Radiology, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

Corresponding author
Department of Radiology,
King Abdulaziz Medical City, Riyadh,
Saudi Arabia;
Email: me.shaal2010@hotmail.com

Citation

ABSTRACT

Objective: Chronic venous insufficiency is a common medical condition in Saudi Arabia. Interventional radiology provides various minimally invasive treatment options for this condition. The aim of this study was to evaluate the awareness of these treatment options in the Saudi population. Methods: A self-administered online survey was distributed randomly via social media channels between June and July 2020. A total of 832 responses were received. Two experienced consultants reviewed the survey results. Results: Analysis of the participants’ knowledge regarding interventional radiology treatment options for chronic venous insufficiency showed that 6.9% had heard of cyanoacrylate embolization, 15.5% knew about radiofrequency ablation therapy, 36.8% knew about endovenous laser ablation, and 37.5% knew about sclerotherapy. A total of 84 participants (10.1%) had a history of chronic venous insufficiency. Among the participants with chronic venous insufficiency, 25% confirmed that their treating doctor had discussed interventional radiology treatment options with them, while 75% denied this. Conclusions: The results of this study indicate the need for an awareness program regarding the role of interventional radiology in the treatment of chronic venous insufficiency.

Keywords: venous insufficiency, interventional radiology, cyanoacrylate embolization, laser ablation, sclerotherapy
1. INTRODUCTION

Chronic venous insufficiency (CVI) is a common medical condition that occurs when the walls of the leg veins do not function effectively. A study performed in Saudi Arabia measured the prevalence of CVI and found that approximately 50% of women and 25% of men had CVI, which is higher than the prevalence of CVI in the Western countries (30% in women and 15% in men) (Bawakid et al., 2005; Alwashbi et al. 2020). Moreover, a high prevalence of varicose veins has led to a considerable burden on the healthcare system (Murad et al., 2011). CVI was previously managed by ligation and saphenous vein stripping with or without ambulatory phlebectomy (Murad et al., 2011). Nowadays, interventional radiology (IR) offers minimally invasive alternatives, such as endovenous thermal ablation, cyanoacrylate embolization (CAE), and sclerotherapy. In endovenous thermal ablation, the vein is occluded using two different energy sources: 1) radiofrequency ablation (RFA), in which radio waves are delivered through a catheter to heat and collapse the target vein; and 2) endovenous laser ablation (EVLA), which is identical to RFA except that it uses laser energy to close the target vein.

In CAE, cyanoacrylate (“superglue”) is carefully injected under ultrasound guidance, and pressure is applied to seal the vein (Attaran, 2018). This procedure provides cosmetic improvement in asymptomatic patients. In symptomatic patients, it relieves symptoms, promotes the healing of ulcers, and reduces the rate of recurrence. In sclerotherapy, a series of injections with a sclerosing agent are administered directly into the target vein to close it.

The advantages of endovascular therapy over surgery include the avoidance of thigh and ankle incisions, shorter hospital stays, quicker return to work, and comparable long-term success rates (Hardman and Rochon, 2013; Tekin et al., 2016). Ultrasound-guided foam sclerotherapy and RFA are as efficient as vein stripping. Moreover, EVLA is markedly more effective than stripping (Van den Bos et al., 2009). Given the advantages of these alternative treatments, this study aimed to evaluate the knowledge of the Saudi population about CVI treatment options in IR.

2. MATERIALS AND METHODS

This cross sectional study was conducted from June to July 2020 to assess the overall knowledge and awareness of treatment options for CVI using IR in the Saudi population. We constructed a self-administered online survey that was reviewed and validated by two experienced consultants. Once the survey was approved, we distributed the survey randomly via social media channels. The survey was composed of 15 closed-ended questions that included demographic data (age, sex, region, and level of education), participants’ perceptions of CVI, history of CVI and finally, their knowledge on IR treatment options (endovenous thermal ablation, CAE, and sclerotherapy). This survey was voluntary and anonymous, and all participants provided informed consent before taking the survey.

The sample size was calculated using the Raosoft sample size calculator. The minimum sample size required was 387, with a 95% confidence interval. Data are presented as frequencies and percentages. The categorical data were compared using a chi-squared test. Data were analyzed using SPSS (version 25; IBM Corp., Armonk, NY, USA). P-values < 0.05 were considered statistically significant.

3. RESULTS

The study sample included 832 participants. The percentages of participants from each region were as follows: northern, 34.0%; central, 19.4%; eastern, 18.4%; western, 14.2%; and southern, 14.0%. The demographic data are shown in Table 1.

A total of 84 participants (10.1%) had a history of CVI. Although 641 participants (77.0%) stated that they knew about CVI, only 66.7% knew that CVI involves dilatation of the leg veins.

Analysis of the participants’ knowledge about CVI treatment options with IR showed that 57 (6.9%) had heard about CAE, 129 (15.5%) knew about RFA, 306 (36.8%) knew about EVLA, and 312 (37.5%) knew about sclerotherapy. Of those who reported having heard about CVI treatment options using IR, 53% had found the information on the Internet or through social media.

The results showed a significant relationship between region and knowledge about CVI treatment with sclerotherapy, with the southern region having the highest percentage (52.13%); 61 participants; P = 0.006) of participants showing knowledge of CVI treatment. Age was significantly associated with awareness of sclerotherapy as a treatment option for CVI, with 193 participants (45.8%) between the ages of 21 and 30 years having heard about it (P< 0.000).

Knowledge about other IR treatment options was not significantly associated with region or age. There was a significant relationship between working or studying in the medical field and knowing about all IR treatment options for CVI. Table 2 shows the percentage of knowledge regarding IR treatment options in each group.
Table 1 Demographic data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>75.1</td>
</tr>
<tr>
<td>Male</td>
<td>24.9</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Saudi</td>
<td>97.6</td>
</tr>
<tr>
<td>Non-Saudi</td>
<td>2.4</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>Less than 20</td>
<td>10.5</td>
</tr>
<tr>
<td>21-30</td>
<td>50.6</td>
</tr>
<tr>
<td>31-40</td>
<td>16.6</td>
</tr>
<tr>
<td>41-50</td>
<td>15.3</td>
</tr>
<tr>
<td>51-60</td>
<td>5.8</td>
</tr>
<tr>
<td>More than 60</td>
<td>1.3</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
</tr>
<tr>
<td>High school and less</td>
<td>17.8</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>74.8</td>
</tr>
<tr>
<td>Master’s degree and above</td>
<td>7.5</td>
</tr>
<tr>
<td>Work or study in the medical field</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>29.9</td>
</tr>
<tr>
<td>No</td>
<td>70.1</td>
</tr>
</tbody>
</table>

Table 2 Knowledge about interventional radiology treatment options according to medical field involvement

<table>
<thead>
<tr>
<th>Involvement in the Medical Field</th>
<th>Yes</th>
<th>No</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiofrequency</td>
<td>26%</td>
<td>10.9%</td>
<td>0.000</td>
</tr>
<tr>
<td>Cyanoacrylate</td>
<td>13.7%</td>
<td>3.9%</td>
<td>0.000</td>
</tr>
<tr>
<td>Endovenous Laser Ablation</td>
<td>49.8%</td>
<td>31.2%</td>
<td>0.000</td>
</tr>
<tr>
<td>Sclerotherapy</td>
<td>59.8%</td>
<td>27.9%</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Those with a higher level of education (master’s or doctoral degree) had heard more about cyanoacrylate (21%) and EVLA (53.2%) as treatment options for CVI than those with a lower level of education (Bachelor’s degree and high school or less) ($P < 0.000$ and $P = 0.03$, respectively). Awareness of sclerotherapy and RFA as treatment options for CVI was higher in men than in women. Approximately 43.5% ($P = 0.040$) and 19.8% ($P = 0.048$) of men knew about sclerotherapy and RFA as treatment options, respectively.

Figure 1 Symptoms of participants with chronic venous insufficiency in percentages.
Almost half of the participants diagnosed with CVI (51.1%) had heard about EVLA as a treatment option, while 35.2% of those without the condition had heard about it ($P = 0.004$). Interestingly, being diagnosed with CVI was not significantly associated with knowledge about other IR treatment options. Among those who were diagnosed with CVI, only 21 participants (25%) confirmed that their treating doctor had discussed IR treatment options with them, while 63 participants (75%) denied this. The most reported symptom in participants with CVI was pain and heaviness in the leg (55.95%). Other complaints are described in Figure 1.

4. DISCUSSION
In this cross-sectional study, we found a significant relationship between working or studying in the medical field and knowing about all IR treatment options for CVI and between region and knowledge about sclerotherapy. Moreover, CVI diagnosis was not significantly associated with knowledge about IR treatment options. CVI is a common medical condition in Saudi Arabia (Bawakid et al., 2005). IR allows for minimally invasive procedures to treat CVI, and has shown lower rates of recurrence, shorter hospital stays, and better cosmetic outcomes compared to surgery (Hardman and Rochon, 2013; Tekin et al., 2016). Additionally, IR procedures have shown high success rates and low complication rates. Sclerotherapy, for example, has an 85% success rate and 1.2% complication rate (Rathbun et al., 2013). Ablative therapy has a complication rate of less than 5% (Gibson et al., 2007; Van den Bos et al., 2009; Lawrence et al., 2010). In a study by Makary et al. (2019), 2.5% of healthcare providers reported that they had excellent knowledge about IR. Although many patients who are referred for IR therapy are satisfied with the results, most are unaware of what the field is or may offer (Baerlocher et al., 2007).

Two studies conducted to assess the knowledge about IR procedures as treatment options for two medical conditions in Saudi Arabia showed a low level of knowledge among patients (Albaqawi et al., 2020; Alreshidi et al., 2020). Albaqawi et al. (2020) concluded that 74.2% of patients had never heard about RFA as a therapeutic modality for thyroid nodules. Another study conducted to assess the knowledge about uterine artery embolization among Saudi women showed that 76.1% had never heard of uterine artery embolization (Alreshidi et al., 2020). To our knowledge, our study is the first study to assess Saudi population's awareness about IR procedures for treating CVI.

Our results from the anonymous online survey showed that most respondents had no awareness of IR treatment options for CVI. Involvement in the medical field, either by working or studying, had a significant impact on the knowledge about IR treatment options for CVI. The level of education was also an important factor, as more participants with a master's degree or more advanced educational qualifications had heard about CAE and EVLA than those with a lower level of education. Only one quarter of the participants with CVI agreed that their treating doctor had discussed IR treatment options with them.

5. CONCLUSION
As critical medical decisions require patients to be well-informed and involved in the decision-making process, the results of this study indicate the need for further efforts to increase public awareness of the role of IR in the treatment of CVI.

Author’s Contributions
Meshael Alreshidi: study design and concept, questionnaire design, data collection, data analysis, data interpretation, manuscript preparation, manuscript editing, manuscript review, approval of the version.
Mohammad Altraifi: questionnaire design, data collection, data analysis, data interpretation, manuscript preparation, manuscript editing, approval of the version.
Nouf Alghris & Amirah Alshammari: literature search, data collection, data analysis, data interpretation, manuscript preparation, approval of the version.
Aljoharah Alwajaan, Elaf Altebainawi, Afnan Alshammari & Saleh Alamari: data collection, data analysis, data interpretation, manuscript preparation, approval of the version.
Ibrahim Alrashidi: questionnaire design, data analysis, data collection, manuscript editing, manuscript review, Final approval of the version.

Acknowledgement
The authors would like to thank all the participants who contributed samples to the study.

Conflicts of interest
The authors declare that they have no conflict of interest.
Funding
This study has not received any external funding.

Ethical approval
This study was approved by the Research Ethics Committee at the University of Hail. Ethical approval number: H-2020-153.

Data and materials availability
All data associated with this study are present in the paper.

REFERENCES AND NOTES


Peer-review
External peer-review was done through double-blind method.

Article History
Received: 27 October 2020
Reviewed & Revised: 28/October/2020 to 03/December/2020
Accepted: 04 December 2020
E-publication: 12 December 2020
P-Publication: November - December 2020

Publication License
This work is licensed under a Creative Commons Attribution 4.0 International License.

General Note
We recommended authors to print article as color digital version in recycled paper. Discovery Scientific Society will not provide any prints for subscription.