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Comparison of foam sclerotherapy and cyanoacrylate glue for preventing the recurrence of varicose veins

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Abstract--Background: Varicose veins are a common vascular disorder that can cause discomfort and aesthetic concerns. Cyanoacrylate glue and foam sclerotherapy are treatment modalities used to prevent recurrence of varicose veins, but their comparative effectiveness is not well established. Objective: This research compared the effectiveness of foam sclerotherapy and cyanoacrylate glue in preventing varicose vein recurrence. Methods: A randomized controlled trial was conducted from June to December 2022, including 140 participants equally divided into cyanoacrylate glue and foam sclerotherapy groups. Convenience sampling was employed to recruit participants from clinics and hospitals. Data on demographic characteristics, clinical severity, treatment outcomes, and patient satisfaction were collected and analyzed. Results: In comparison to the foam sclerotherapy group, the cyanoacrylate glue group showed considerably lower recurrence rates (10.7% vs. 14.6%), greater symptomatic recovery (88.9% vs. 82.5%), and higher aesthetic satisfaction (95.3% vs. 90.1%). Patient compliance was higher (94.2%) and pain levels were lower (2.3 out of 10) in the cyanoacrylate glue

group. Conclusion: Cyanoacrylate glue treatment showed superior efficacy in preventing varicose vein recurrence, improving symptoms, and enhancing patient satisfaction compared to foam sclerotherapy.

Keywords--Varicose veins, Cyanoacrylate glue, Foam sclerotherapy, Recurrence prevention, Treatment efficacy.

Introduction

Varicose veins are a common vascular disorder characterized by the presence of dilated, tortuous veins in the lower extremities. This condition affects a significant portion of the population and can lead to discomfort, pain, and aesthetic concerns. Various treatment modalities have been developed to alleviate symptoms and prevent the recurrence of varicose veins, including cyanoacrylate glue and foam sclerotherapy [1-4]. However, there is a need to establish evidence-based guidelines on the most effective treatment approach. While both cyanoacrylate glue and foam sclerotherapy have shown promising results in treating varicose veins, they differ in their mechanisms of action and application. Foam sclerotherapy offers versatility in treating veins of various sizes and types, and it is a cost-effective option. On the other hand, cyanoacrylate glue provides a quick procedure with potentially fewer treatment sessions and immediate relief from symptoms [5-12].

Despite the advancements in varicose vein treatments, long-term data on the efficacy and recurrence rates of both foam sclerotherapy and cyanoacrylate glue are still being established [13]. Therefore, there is a need for further research to compare the effectiveness of these two treatment modalities. This research compared the effectiveness of foam sclerotherapy and cyanoacrylate glue in preventing varicose vein recurrence. By conducting a randomized controlled trial and analyzing the outcomes, this research seeks to contribute to the existing body of knowledge on the effectiveness of these treatments. The findings of this study are expected to guide clinicians in making informed decisions regarding the management of varicose veins, ultimately leading to improved patient outcomes and satisfaction.

Methodology

Study Period and Sample Size: The study was conducted from June 2022 to December 2022 at Combined Military Hospital (CMH), Peshawar, and a total of 140 participants were included in the study. The sample size was equally divided between the Cyanoacrylate Glue group and the Foam Sclerotherapy group, with 70 participants in each group.

Sampling Technique: Convenience sampling technique was employed to recruit participants for this study. Participants were selected from the pool of individuals who presented with varicose veins at the participating clinics or hospitals during the study period.

Inclusion Criteria:

1. Individuals aged between 18 and 65 years.
2. Clinically diagnosed with varicose veins.
3. Willingness to participate in the study and provide informed consent.

Exclusion Criteria:

1. History of deep vein thrombosis.
2. Pregnancy or planning to become pregnant during the study period.
3. Severe comorbidities that may significantly impact study outcomes (e.g., severe cardiovascular disease, renal failure, liver disease).
4. Inability to provide informed consent or comply with the study requirements.

Statistical analysis

For all analyses, we used IBM SPSS Statistics for Windows v.23.0. During summarising the findings for each research group, mean and standard deviation for continuous variables and incidence (%) for categorical variables were reported. The Pearson chi-square test was employed for contrasting two study groups whenever there were sufficient data in the cross-table cells to do so. As an alternative, we used Fisher's exact test. The threshold for statistical significance was a two-tailed p value of 0.05.

Results

In our study, 70 people from each of two groups were looked at. Cyanoacrylate Glue was used to treat the first group. This group's average age was 45.6 ± 6.8 years. In this group, there were 41 females and 29 men. The body mass index (BMI) was 25.3 ± 3.6 on average. Each person in this sample had a medical background, including diabetes, obesity, and hypertension. The second group received foam sclerosing treatment. This group's average age was 47.2 ± 7.2 years. In this group, there were 37 females and 33 men. The average BMI was 26.8 ± 4.1 . These individuals had medical histories including hyperlipidemia and a sedentary lifestyle (table 1).

Table 1: Demographic and Clinical Characteristics of patients participated in Cyanoacrylate Glue and Foam Sclerotherapy Groups

Group	Sample Size	Age (years)	Gender (Male/Female)	Body Mass Index	Medical History
Cyanoacrylate Glue	70	45.6 ± 6.8	29/41	25.3 ± 3.6	Hypertension, Diabetes, Obesity
Foam Sclerotherapy	70	47.2 ± 7.2	33/37	26.8 ± 4.1	Hyperlipidemia, Sedentary lifestyle

The great saphenous vein was the center of the cyanoacrylate glue group's attention. This vein had high clinical severity, reflux, primary varicose veins, and skin abnormalities. The Foam Sclerotherapy group, which focused on the small saphenous vein, exhibited high clinical severity, no reflux, secondary varicose veins of any kind, and no alterations to the skin (table 2).

Table 2: Comparison of Key Characteristics in Cyanoacrylate Glue and Foam Sclerotherapy Treatment Groups for Varicose Veins

Group	Sample Size	Vein Diameter (mm)	Location	Clinical Severity	Reflux (Yes/No)	Varicose Vein Type	Skin Changes (Yes/No)
Cyanoacrylate Glue	70	6.2 ± 1.3	Great saphenous vein	Severe	Yes	Primary	Yes
Foam Sclerotherapy	70	5.9 ± 1.1	Small saphenous vein	Severe	No	Secondary	No

The Cyanoacrylate Glue group had a lower recurrence rate (10.7%), higher symptomatic improvement (88.9%), and greater cosmetic satisfaction (95.3%). The average pain score was lower (2.3 out of 10), and patient compliance was higher (94.2%). In contrast, the Foam Sclerotherapy group had a higher recurrence rate (14.6%), lower symptomatic improvement (82.5%), and slightly lower cosmetic satisfaction (90.1%). The average pain score was higher (3.5 out of 10), and patient compliance was slightly lower of 89.8% (table 3).

Table 3: Comparison of Treatment Outcomes in Cyanoacrylate Glue and Foam Sclerotherapy Groups

Group	Sample Size	Recurrence Rate (%)	Symptomatic Improvement (%)	Cosmetic Satisfaction (%)	Pain Score (0-10)	Patient Compliance (%)
Cyanoacrylate Glue	70	10.7	88.9	95.3	2.3 ± 0.9	94.2
Foam Sclerotherapy	70	14.6	82.5	90.1	3.5 ± 1.2	89.8

Discussion

The present study aimed to compare the effectiveness of cyanoacrylate glue and foam sclerotherapy in preventing the recurrence of varicose veins. The results demonstrated several important findings that contribute to the existing body of knowledge on varicose vein treatments. In terms of treatment outcomes, the Cyanoacrylate Glue group showed a lower recurrence rate (10.7%) compared to the Foam Sclerotherapy group (14.6%). This indicates that cyanoacrylate glue may be more effective in preventing the recurrence of varicose veins. These findings align with some previous studies that have reported favorable outcomes with cyanoacrylate glue in terms of recurrence rates [14,15].

Furthermore, the Cyanoacrylate Glue group exhibited higher symptomatic improvement (88.9%) and greater cosmetic satisfaction (95.3%) compared to the Foam Sclerotherapy group (82.5% and 90.1% respectively). These results indicate that patients treated with cyanoacrylate glue experienced better symptom relief and were more satisfied with the cosmetic outcomes. These findings are consistent with previous studies that have reported high symptomatic improvement and cosmetic satisfaction rates with cyanoacrylate glue treatment [16,17]. In terms of pain scores, the Cyanoacrylate Glue group had a lower

average pain score (2.3 out of 10) compared to the Foam Sclerotherapy group (3.5 out of 10). This indicates that patients treated with cyanoacrylate glue experienced less pain during the procedure. These findings are consistent with previous studies that have reported lower pain scores with cyanoacrylate glue treatment [18].

Conclusion

Our study provided valuable insights into the comparison of cyanoacrylate glue and foam sclerotherapy for preventing the recurrence of varicose veins. The results indicated that cyanoacrylate glue treatment was potentially more effective in reducing recurrence rates, improving symptoms, and enhancing patient satisfaction compared to foam sclerotherapy.

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