Is There a Need for Doppler Vascular Examination for the Diagnosis of Varicose Vein? A Prospective Study

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Key Words

Varicose vein · Clinical examination ·
Doppler ultrasound · Vascular laboratory

Abstract

Objective: To compare the validity of a careful clinical examination with venous Doppler studies in the management of patients presenting with varicose veins. **Subjects and Methods:** Ninety-five consecutive patients presenting with varicose veins from September 1998 to August 1999 were included in this study. Of the 95 patients, 52 were males and 43 females. Eighty-four were expatriate laborers and 11 Kuwaiti nationals. Seventy-one were active workers under the age of 30. All of the patients underwent a full clinical examination for varicose veins, and a management plan was developed for each patient prior to Doppler venous study. The results of the Doppler studies were then compared with the clinical examination results, and the management plan was changed, if necessary, based on the Doppler results. **Results:** Both clinical and Doppler examinations were equally effective in diagnosing primary varicose vein and identifying sites of venous incompetence. A family

history for varicose veins was found in 21% and standing for a long period of time was a risk factor in 51% patients. The most common symptoms were pain and heaviness. Doppler study findings were useful in changing the management plan of 14 (15%) patients, 6 with recurrent varicose vein and 8 obese patients with chronic venous insufficiency. The majority of the patients (n = 82) benefited from surgery and were free of symptoms. **Conclusion:** This prospective study demonstrated that detailed clinical examination was sufficient to diagnose most patients suffering from primary varicose veins. Doppler vascular studies were useful in changing the treatment modality for those presenting with recurrent varicose vein or obese patients with signs and symptoms of chronic venous insufficiency with no clinically clear varicosity.

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Introduction

Although varicose veins are not generally responsible for serious illness [1], Doppler venous studies are of great help in defining sites of reflux and the follow-up. How-

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ever, instead of carrying out detailed clinical evaluation of the venous system, surgeons tend to become heavily dependent on Doppler studies to diagnose varicose veins. The one vascular laboratory in Kuwait serving a population of two million, performs about 4,000 tests per year. As 41% of these tests (1,596/3,830) are venous studies, a tremendous load is placed on the vascular laboratory. To determine if this degree of Doppler testing is necessary, we decided to compare the validity of clinical examination with venous Doppler studies.

Material and Methods

Ninety-five consecutive patients presenting with varicose veins from September 1998 to August 1999 were included in this study. Of the 95 patients, 52 were males and 43 females. Eighty-four were expatriate laborers and 11 Kuwaiti nationals. Seventy-one were active workers under the age of 30. The mean age of the cohort was 34 ± 5.12 years. Demographics, symptoms, risk factors, and results of the examinations were entered in a database specifically designed for the study. The same team of surgeons evaluated all the patients, and a standard examination that included cough impulse, percussion, Trendelenburg and tourniquet tests, and Fegan's method (for finding perforators) was done [2]. Clinical diagnosis and type of management plan were determined by staff. The patient was then referred to the vascular laboratory for venous Doppler ultrasound examination of the lower limb. The test was performed using a hand-held pocket Doppler ultrasound machine (Meda Sonics, Fremont, Calif., USA). The patient was examined in the supine and standing positions, for superficial long and short saphenous veins, deep femoral, popliteal and tibial veins and perforators.

The results of the Doppler studies were then compared with the clinical examination results, and the management plan was changed based on the Doppler results if necessary. The median follow-up period was 12 months (52% of cases were followed up at 12 months).

During the follow-up these patients were seen in the Vascular Surgery Outpatient Clinic (Peripheral Arterial and Venous Clinic) by members of the staff who were not aware of the study. Records of patients involved in the study were later reviewed by a senior staff who was aware of the study, for evaluating patient satisfaction.

Statistical Analysis

Data were analyzed with GraphPad InStat 3.01, GraphPad Software, San Diego, Calif., USA. Fisher's exact test was used for nominal variables, and two-tailed t test for continuous variables. A p value of 0.05 or less was considered significant.

Results

The patient's demographics, symptoms and risk factors are shown in table 1. Pain and heaviness was the most frequent presenting symptoms (64%), and long periods of standing were the most common occupational risk factor

Table 1. Demographic data, symptoms and risk factors

	Patients	
	n	%
Demographics		
Male sex	53	55
Age less than 30 (year)	71	75
Kuwaiti	11	11
Family history	20	21
Recurrent varicose vein	6	6
Symptoms		
Pain/heaviness	61	64
Pain/heaviness/swelling	21	22
Cosmetic	8	8
Chronic venous insufficiency ¹	5	5
Risk factors		
Long standing	49	51
Pregnancy/long standing	19	20
No risk factor	20	20
Pregnancy	4	4
Deep vein thrombosis	1	1

¹ Chronic venous insufficiency is defined as: patients presenting with vague aches in the lower limbs on long standing with edema and/or skin changes (spiders, fine reticular veins, skin dryness or pigmentation in the lower third of the leg).

(51%). Of the 95 patients, 20 (21%) had a family history of varicose vein.

A comparison of clinical and Doppler findings is given in table 2, indicating no statistically significant difference between them. In 81 (85%) of the patients, the results of the Doppler venous studies did not change the surgical management plan; 82 (86.3%) were treated surgically, 10 (10.5%) were treated with sclerotherapy, and 3 were treated conservatively (compression stocking) (table 3). Of the 10 treated with sclerotherapy, 2 had a recurrence. However, in 14 (15%) patients the plan had to be changed. Six of these had recurrent varicose veins, while 8 were obese with chronic venous insufficiency, presenting with spiders and reticular varicosity without clinically obvious varicose veins. In these cases, management changes involved surgery for perforators and/or sclerotherapy in addition to high ligation of the saphenofemoral and/or saphenopopliteal junctions. During the follow-up period most patients were satisfied by the results of surgery.

Table 2. Clinical and laboratory examinations

Site of incompetence	Clinical		Vascular lab		p value
	n	%	n	%	
1 Saphenofemoral junction (SFJI)	3	3	6	6	NS
2 Long saphenous vein (LSVI)	14	15	12	13	NS
3 Short saphenous vein (SSVI)	3	3	5	5	NS
4 Perforators (PI)	5	5	5	5	NS
5 SFJI, LSVI, SSVI and PI	5	5	6	6	NS
6 SFJI and LSVI	36	36	32	33	NS
7 SFJI, LSVI, and SSVI	16	17	18	19	NS
8 SSVI and PI	6	6	7	7	NS
9 LSVI and PI	7	7	4	4	NS

NS = Not statistically significant ($p > 0.05$).

Table 3. Surgical management

	n	%
Operation	82	86
Sclerotherapy	10	10
Conservative	3	3
Recurrence	2	2 ^a

^a Sclerotherapy group.

Discussion

In this cohort study, more males than females presented with varicose vein diseases, inconsistent with a previous report [3]. The probable explanation is that most females in this society wear long dresses for religious and cultural reasons, therefore unsightly reticular or spider varicosities are of no great concern to most of them. On the other hand young laborers (mostly expatriates) who spend long hours standing in different jobs (maids, house helpers, builders, security officers etc.) develop symptomatic varicosities and seek medical advice. As these laborers comprised 75% of our sample, the true prevalence of varicose vein in Kuwait may not have been reflected in this study.

The symptoms and risk factors in our cohorts were similar to those reported in the literature [1]. Both detailed clinical examination and Doppler examination of the venous system of the lower limb were equally effective in identifying sites of venous incompetence (table 2). The most common site of incompetence was the saphenofe-

moral junction and the least common site was the short saphenous vein. Doppler ultrasound examination did not provide additional information and therefore did not change the surgical plan in the majority of these patients. In only 15% of patients did the Doppler studies result in change of the plan of treatment. Six of them were previously treated for varicose vein by general surgeons in other hospitals and 8 were obese with chronic venous insufficiency.

Therefore, we suggest that Doppler vascular laboratory studies should be reserved for this group of patients. Restricting vascular laboratory studies to these indications should reduce the workload of the laboratory, decrease demand on equipment, save money and permit allocation of resources to other areas.

Duplex scanning and hand-held Doppler are accurate for the identification of reflux sites (saphenofemoral and saphenopopliteal junctions) and recurrent disease [4–14]. Previous retrospective studies showed that traditional clinical examination alone was unreliable in assessing varicose veins and that Doppler and duplex are more reliable for the diagnosis of primary varicose veins [8, 11–16]. However, surgery for primary varicose veins based upon the hand-held Doppler alone missed 24% of reflux sites untreated [5].

Our findings are similar to two recent prospective studies in which Aiono et al. [17] reported higher sensitivity and specificity of clinical examination alone over the hand-held Doppler examination in the diagnosis of the short saphenous vein pathology, and Smith et al. [18], who studied 149 patients and showed that no additional benefit was gained from preoperative duplex scanning over that of clinical and hand-held Doppler.

Conclusion

This prospective study demonstrated that a focused and detailed clinical examination is sufficient to diagnose most primary varicose vein patients. However, Doppler ultrasound examination was useful in changing the treatment modality in 6 patients with recurrent varicose vein and in 8 obese patients with chronic venous insufficiency.

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