

Concordance of Clinical Examination and Duplex Scan Findings for Prediction of Surgery in Patients Presenting with Varicose Vein

Hamid Mehmood¹, Mudassar Murtaza², Usman Aslam³, Assam Sarwar⁴, Ammara Waqar⁵, Awais Gohar⁶

Author's Affiliation

¹Professor of Bio Chemistry, SZABMU, Islamabad

²Assistant Professor Surgery, Fatima Jinnah Medical University Lahore

³Assistant Professor, Orthopedics, Red Crescent medical college, Lahore

⁴ Assistant Professor, Fatima Jinnah Medical University, Lahore

^{5,6}Ph.D Scholar, University of Lahore, Lahore

Author's Contribution

^{1,2}Principal researcher

³Data collector

⁴Article writing and literature review

⁵Referencing

Article Info

Received: Nov 21, 2017

Accepted: April 11, 2018

Funding Source: Nil

Conflict of Interest: Nil

Address of Correspondence

Prof. Hamid Mehmood

drhamidmehmood373@gmail.com

ABSTRACT

Objective: To assess the concordance of clinical examination and duplex scan findings for prediction of surgery in patients having varicose vein.

Methodology: The cross sectional study was conducted in tertiary referral vascular surgery unit, Dublin, Ireland. From January 2015 to December 2016. The study conducted on the patients with varicose veins between 18-50 years who had duplex scan performed over the last two years (n=175) in the hospital. Clinical diagnosis was done by using Clinical-Etiological-Anatomical-Pathophysiology (CEAP) classification. Numerical variables age, duration of symptoms, weight, height and BMI were presented. Categorical variables gender and presence of varicose vein on clinical examination CEAP grade ≥ 2 and colored duplex ultrasound for the prediction of surgery was presented as concordance.

Results: In 95% (n=166) of patient's surgery was predicted and in remaining surgery was not predicted. 171 (97.7%) were diagnosed with incompetent varicose vein on Duplex Scan while 4 (2.3%) were not. Forty seven percent (n=82) patients had incompetent SFJ, 36% (n=63) had Incompetent SPJ and 11% (n=19) had mixed type of varicose veins when diagnosed on Duplex Ultrasound. The study results showed that in 97.7%(171) patient's surgery was predicted by Duplex Ultrasound and in remaining surgery was not predicted.

Conclusion. There is increase in prediction of surgery for varicose veins with duplex scan modality.

Keywords: Varicose Vein, Duplex ultrasound, Concordance, Clinical Examination.

Introduction

The prevalence of varicose veins in the European / Irish adults is approximately 13%. Women are the worst sufferers as compared to men and they have prevalence increase when they reach more than 45 years of age.¹ Varicose veins present a very effective vascular service to the human body.² A varicose vein is one whose valves become incompetent and as a result it has become dilated, elongated, tortuous, pouched and friable.³ From this dilation and possibly from defects (congenital or acquired) in the valves themselves, the terminal valve guarding the union of the long saphenous vein with the femoral vein (and less often of the short saphenous vein with the popliteal vein) ultimately become inefficient and blood regurgitates into superficial veins from the deep veins of lower limb. This leads to

retrograde circulation away from the heart. The pressure in the main venous system is exerted on these superficial veins setting up a vicious circle increasing the distension and vascular stagnation and converting the subcutaneous venous system of the legs into a cul-de-sac of the main venous system.⁴ The varicose veins can produce painful when the person stands for a long time. It may lead to swelling of the legs, eczema, and ulceration in the legs. Although, no mortality is produced only due to varicose veins but it may lead to deep veins thrombosis.

A study was conducted to evaluate the diagnostic accuracy of clinical examination taking colored duplex ultrasound as gold standard for varicose vein.⁵ The study reported 95% specificity

and 100% sensitivity respectively when colored duplex ultrasound taken as gold standard.⁶

Methodology

The cross sectional study was conducted in tertiary referral vascular surgery unit, Dublin, Ireland. From January 2015 to December 2016 Consecutive non probability sampling technique was used for the purpose of patient's data collection.

Inclusion criteria:

1. Age ranged 18-50 years
2. Both genders
3. Varicose veins who underwent duplex study
4. Acceptance to participate in the study

Exclusion criteria:

1. Patients with recurrent varicose vein
2. Patients with malignancy
3. Patients with congenital anomalies.
4. Patients with history of DVT

For the purpose of diagnosis, duplex ultrasound is known to be the gold standard. The importance of clinical tests is of great importance which are narrated below:

- Trendelenburg test– this test is used to determine the site of venous reflux and the nature of the sapheno femoral junction
- Multiple tourniquet test – this test is carried out to diagnose more accurately localize the site of the venous reflux
- Fegan's test – this test is done to assess the nature of any perforating vein blow outs
- Perthes test – this test is done to check the patency of the deep veins

All the patients with varicose veins who had duplex scan performed over the last two years in the hospital. The questionnaire was prepared in the local language and the consent was taken from the patients for the purpose of the study. The permission was also taken from the Ethical Review Board of the Hospital. Clinical diagnosis of varicose veins was done by using CEAP classification. Afterwards patients had duplex ultrasound. All the data was collected through a well defined Performa.

The data has been collected in Excel sheet. Afterwards, an analysis was carried out using SPSS Version 20. Numerical variables age, duration of symptoms, weight, height and BMI was presented. Categorical variables gender and presence of varicose vein on clinical examination CEAP grade 2 or more and

colored duplex ultrasound for the prediction of surgery was presented as frequency and percentages. Effect Modifiers like age, BMI, Gender, was stratified. Post stratification kappa statistics were applied to see the strength of agreement. Kappa value >0.80 was considered as significant.

Results

In this study the mean age was 33.17 ± 10.33 years with minimum and maximum of 18 & 50 years respectively. Male patients were 47 % (83) and 53% (92) were female. mean weight was 70.58 ± 9.24 kg with minimum and maximum of 48 & 84 kg respectively.

Mean height was 168.01cm with the minimum and maximum of 158cm and 181cm respectively and Mean BMI was 25.10 ± 3.86 with the minimum and maximum BMI of 15.32 & 32.41 respectively. The study results showed that the mean duration of symptoms in years was 10.41 ± 6.32 with the minimum and maximum of 1 and 20 respectively.

In our study 166 (95%) were diagnosed with varicose vein by CEAP 2 classification while 9 (55%) were not. In 95% (166) patient's surgery was predicted by CEAP 2 classification and in remaining surgery was not predicted. In 97.7% (171) patient's surgery was predicted by Duplex Ultrasound and in remaining surgery was not predicted. **Table I.**

Table I: Agreement between Prediction of Surgery by CEAP 2 Classification and Duplex Ultra Sound

n = 175	Prediction of Surgery by Duplex Scan		Total	
	Yes	No		
Prediction of Surgery through CEAP 2	Yes	166	0	166
	No	5	4	9
Total		171	4	175

Involvement of different venous systems on duplex ultrasound is shown in **Table II**

Kappa Statistics: 0.60

P-Value: 0.000

Table II: Frequency of Types of Incompetence Varicose Veins on Duplex Scan (Reflux)

	Frequency	Percentage
Absent	9	2
Incompetent SFJ	82	47
Incompetent SPJ	63	36
Deep Venous Incompetence	14	5
Mixed	7	11
Total	175	100

Discussion

The varicose veins are seen mostly in the European countries. The incidence of the varicose veins is also evident from the Hospital record. The incidence of varicose veins increases with the age. Studies have shown that the women are more sufferers as compared to males. A varicose vein is one whose valves become incompetent and as a result it has become dilated, elongated, tortuous, pouched and friable.³ 175 patients with varicose veins had duplex scan performed over the last two years (>150) in the hospital. All the patients were informed for the purpose of the study and written informed consent was obtained from the patients. Clinical diagnosis of varicose veins was done by using CEAP classification. Afterwards patients had duplex ultrasound. All the data was collected through a well defined Performa. In this study the mean age was 33.17 ± 10.33 years with minimum and maximum of 18 & 50 years respectively. mean BMI was 25.10 ± 3.86 with the minimum and maximum BMI of 15.32 & 32.41 respectively. mean duration of pain was 10.41 ± 6.32 with the minimum and maximum of 1 and 20 respectively. In our study 166 (95%) were diagnosed with varicose vein by CEAP 2 classification while 9 (55%) were not. Ninety one (52%) patients had LSV, 39% (68) had SSV and 4% (7) had mixed type of varicose veins when diagnosed by CEAP classification. The study results showed that in 95% (166) patient's surgery was predicted by CEAP classification and in remaining surgery was not predicted. In our study 171 (97.7%) were diagnosed with incompetence of varicose vein on Duplex Scan while 4 (2.3%) were not. In this study 47% (82) patients had incompetent SFJ, 36% (63) had Incompetent SPJ, 5% (8) Deep Venous Incompetence and 11% (19) had mixed type of varicose veins when diagnosed on Duplex Ultrasound. The study results showed that in 97.7% (171) patient's surgery was predicted by Duplex Ultrasound and in remaining surgery was not predicted. A study was conducted to evaluate the diagnostic accuracy of clinical examination taking colored duplex ultrasound as gold standard for varicose vein. The study reported 95% specificity and 100% sensitivity respectively when colored duplex ultrasound taken as gold standard.⁶ A study conducted in India reveals that the clinical examination and Doppler ultrasound together have more validity for surgery than both of them alone and use of combination can reduce 16 negative explorations per 10 patients.⁷ There are some variables which affect the Doppler accuracy. These variables include timing in day (morning vs afternoon), position of patient and reflux provoking maneuver.⁸ In another study the clinical examination methods to diagnose varicose veins are unsatisfactory.⁹ In a recent study conducted

in India Saphenofemoral incompetence was diagnosed in all cases both by clinical examination and Doppler ultrasound. However, in the evaluation of perforator competency, the sensitivity was 82.93% by clinical tests and 97.56% by Doppler ultrasound.¹⁰

The explosion in knowledge in the latter part of the century has lead to a deeper understanding of the pathophysiology of many conditions and technological advances have lead to the development of cheaper instruments, which may aid in clinical diagnosis. This has implications for what medical students learn, as the volume of information is increasing and there appears to be little effort to assess the quality of some of the established information.

Conclusion

Our study results concluded that in 97.7% (171) patients surgery was predicted by Duplex Ultrasound and on the other hand 95 % patient's surgery was predicted by clinical examinations thus proving added benefit of duplex Ultrasound.

Limitation: As far as already published literature is concerned there was no local study available. This study will help surgeons in decision making regarding prediction of surgery.

References

1. Kim J, Richards S, Kent PJ. Clinical examination of varicose veins--a validation study. *Annals of the Royal College of Surgeons of England*. 2012; 82(3):171.
2. Lee AJ, Evans CJ, Allan PL, Ruckley CV, Fowkes FGR. Lifestyle factors and the risk of varicose veins: Edinburgh Vein Study. *Journal of clinical epidemiology*. 2003; 56(2):171-9.
3. Ihsan HR, Saeed M, Ilyas M, Ghani N. Diagnostic accuracy of doppler ultrasound in comparison with venography in the diagnosis of varicose veins of the legs. 2011.
4. Onida S, Lane RA, Davies AH. Varicose veins and their management. *Surgery (Oxford)*. 2013; 31(5):211-7.
5. Campbell B. Varicose veins and their management. *British Medical Journal*. 2006; 7562:287.
6. Kumar P. Clinical Study of varicose veins and their management. *International Journal of Biomedical and Advance Research*. 2015; 6(8):564-87.
7. Sureshkumar S, Vignesh N, Venkatachalam J, et al. (January 05, 2018) Clinical Tests Combined with Color Doppler Versus Color Doppler Alone in Identifying Incompetent Perforator Veins of the Lower Limb: A Prospective Analytical Study. *Cureus* 10(1): e2026. doi:10.7759/cureus.2026.
8. Lurie F, Comerota A, Eklof B, Kistner RL, et al. Multicenter assessment of venous reflux by duplex ultrasound. *J Vasc Surg* 2012 Feb;55(2):437-45.
9. Kim J, Richards S, Kent PJ. Clinical Examination of Varicose Veins-- A Validation Study. *Ann R Coll Surg Engl*. 2000 May; 82(3): 171-175.
10. Prabhu MA, Natarajan KG, Smile SR. Comparison of clinical tests and doppler ultrasound in the preoperative assessment of lower extremity varicose veins. *Indian J Vasc Endovasc Surg* 2017 ;4:51-3.