



A STUDY OF ANKLE BRACHIAL INDEX(ABI) IN PATIENTS WITH SYSTEMIC HYPERTENSION

General Medicine

Dr. A. S. Thaslim Sulaikal*

Postgraduate *Corresponding Author

Dr. Ravi Srinivas Naik

Professor

Dr. S. MD Abdul Razak

Professor & HOD

ABSTRACT

Background: Patients with systemic hypertension frequently have peripheral arterial disease without any symptoms. An easy way to find peripheral artery disease without any symptoms is by using the ankle brachial index. Peripheral arterial disease is indicated by an ABI of 0.9. Peripheral artery disease predicts a significant cardiovascular risk and is a sign of atherosclerosis. **Aim:** To study the effect of systemic hypertension on ankle brachial index and to assess the effect of age, sex, body mass index and duration of hypertension on ankle brachial index. **Methods:** After excluding the patients with exclusion criteria 198 hypertensive patients who visited the department of medicine, Fathima medical college hospital were studied. Patient details were recorded as per the proforma which included age, sex, BMI, duration of hypertension, ankle brachial index. Data was maintained in master chart and analysed. **Results:** In this investigation, the prevalence of asymptomatic PAD was 47%. In this study, the ABI was 0.9 in 46.8% of the males. In this study, 47.8% of the women had ABIs below 0.9. Age and ABI exhibited an inverse relationship. The length of hypertension and ABI had a negative relationship. Pulse pressure and ABI had an inverse relationship. ABI and BMI had an antagonistic relationship.

KEYWORDS

Systemic Hypertension, Ankle Brachial Index

INTRODUCTION

Hypertension is considered to be one of the leading causes of morbidity globally. Approximately 7.6 million deaths (13–15% of the total) and 92 million disability-adjusted life years globally are due to hypertension. Hypertension increases the risk of cardiovascular disease, renal failure, and peripheral arterial disease. It adds to the total burden of cardiovascular risk factors if other risk factors are also present.

Blood vessels are main structures contributing to the development of hypertension. At the same time they are the target organs for long standing elevated blood pressure. Hypertensive patients with peripheral arterial disease are found to have increased future cardiovascular events.

Hypertension holds the responsibility for most of the stroke deaths and coronary artery disease deaths in India. Hence early diagnosis and treatment of complications is very important so as to reduce the morbidity and mortality in the high risk population. Ankle brachial index (ABI) is a simple and non invasive tool to assess the peripheral artery disease. It indicates the presence of atherosclerosis in the peripheral blood vessel. It is a powerful indicator of generalized atherosclerotic disease including coronary arteries.

Diagnosing PAD is clinically important for these reasons:

The first is to identify patients with elevated risk of myocardial infarction or stroke irrespective of symptoms of PAD. The second is to treat the symptoms of PAD to reduce the functional disability and limb loss.

Peripheral artery disease usually presents with intermittent claudication. Peripheral artery disease becomes a marker for systemic vascular disease as atherosclerosis is the basic pathology in other vessels also. Thus it helps in predicting ongoing atherosclerosis in systemic vessels involving coronary, cerebral, and renal vessels which may lead to an elevated risk of events like myocardial infarction (MI), stroke, and death.

Ankle Brachial Index(ABI) helps in making reliable diagnosis of the peripheral artery disease. Ankle brachial index is a ratio having systolic blood pressure in the ankle as numerator and systolic blood pressure in the arm as denominator. Measurement of ABI is simple and requires a blood pressure apparatus and a hand held Doppler probe. An ABI of less ≤ 0.9 is considered as low ABI. It indicates presence of peripheral artery disease.

Aim Of The Study:

Aim of the study is to study the effect of hypertension on ankle brachial index. To assess the effect of following factors on ankle brachial index a) Age b) Sex c) Body Mass Index d) Duration of Hypertension

MATERIALS AND METHODS :

Hypertensive patients who visit the Department of Medicine, Fathima institute of medical sciences, Kadapa were enrolled for the study after excluding exclusion criteria.

Inclusion criteria :

Hypertensives according to jnc7.

Exclusion criteria :

1. Patients who have diabetes mellitus
2. Patients who have chronic kidney disease
3. Patients who have coronary artery disease
4. Patients who have dyslipidemia
5. Patients who are smokers
6. Patients with symptoms of peripheral artery disease

Setting : Fathima Institute of medical sciences, kadapa

Study design: Cross sectional study

Duration of study : 6 months

Sample size: 198

The data of each patient will be collected on a proforma specially designed for this study. This proforma includes name, age, height of the patient, weight of the patient, systolic blood pressure of the patient, diastolic blood pressure of the patient, duration of hypertension, ankle brachial index.

This data will be analysed for statistical significance and correlation.

Statistical Analysis :

Data obtained were maintained in the master chart in Microsoft Excel format and analysis was done using SPSS 11.5 version. Data was arranged in proportions. The variables were compared using Pearson correlation coefficient. A p value of <0.05 was considered to be statistically significant.

RESULTS:

Distribution Of Age:

A total of 198 patients were included in this study

- 3 % were in the age group of 21- 30 years;
- 15% were in the age group 31-40 years;34% were in the age group of 41-50 years;
- 34% were in the age group of 51-60 years;12% were in the age group of 61-70 years;
- 1% were in the age group of 71-80 years;
- 1 % were in the age group 81- 90 years.

Distribution Of Sex:

Male: 62 , female: 136

Distribution According To BMI:

In my study there were 53% patients with normal BMI. There were 45% of patients were overweight and 2% were obese

Distribution According To Duration Of Hypertension:

Out of 198 patients,

42 patients (21%) were having hypertension for past 1-5 years;

69 patients (35%) were having hypertension for 6-10 years;

52 patients (26%) were having hypertension for 11-15 years;

22 patients (11%) were having hypertension for 16-20 years;

9 patients (5%) were having hypertension for 21-25 years

4 patients (2%) were having hypertension for 26-30 years.

Correlation Between Htn Duration And ABI:

Duration	≤0.9	>0.9
1 - 5 YEARS	11.9	88.1
6 - 10 YEARS	23.2	76.8
11- 15 YEARS	80.8	19.2
16- 20 YEARS	86.4	13.6
21- 25 YEARS	88.9	11.1
26- 30 YEARS	100	0

Comparison Between Sex And ABI:

In this study 46.8% of males have $ABI \leq 0.9$ and 47.8% of females have $ABI \leq 0.9$.

There were a total of 198 patients enrolled in this study.

- Prevalence of asymptomatic PAD was found to be 47%
- $ABI \leq 0.9$ in 46.8% males
- $ABI \leq 0.9$ in 47.8% females
- There was inverse correlation between age and ABI
- There was inverse correlation between ABI and BMI
- There was inverse Correlation between ABI and systolic pressure
- There was inverse correlation between ABI and diastolic pressure
- There was inverse correlation between ABI and pulse pressure
- There was inverse correlation between ABI and duration of hypertension.

CONCLUSION:

Patients with hypertension who do not have any co-morbid conditions frequently have subclinical peripheral artery disease. An effective way to find patients who are more at risk for cardiovascular disease is to measure the ankle brachial index. A treatment doctor could be of assistance by promoting risk-reduction strategies.

Since the ankle brachial index is secure, simple, and patient-friendly, it would be advantageous to incorporate it into a primary care regimen. Future cardiovascular events in hypertensive people could be considerably reduced by measuring ABI.

REFERENCES:

1. getABI Study Group. getABI: German epidemiological trial on ankle brachial index for elderly patients in family practice to detect peripheral arterial disease, significant marker for high mortality. VASA 2002; 31:241 –248. 8. Diehm C, Schuster A, Allenberg H, Darius H, Haberl R, Lange S, Pittrow D, von Stritzky B, Tepohl G, Trampisch H. High prevalence of peripheral arterial disease and comorbidity in 6,880 primary care patients: crosssectional study. Atherosclerosis 2004;172:95–105. 9. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation classification stratification. Kidney Disease Outcome Quality Initiative. Am J Kidney Dis 2002;39:S1 –S246. 10. Vester B, Rasmussen K. High performance liquid chromatography method for rapid and accurate determination of homocysteine in plasma and serum. Eur J Clin Chem Clin Biochem 1991;29:549 –554. 11. Orchard TJ, Strandness DE Jr. Assessment of peripheral vascular disease in diabetes. Report and recommendations of an international workshop sponsored by the American Diabetes Association and the American Heart Association, September 18–20, 1992, New Orleans, Louisiana. Circulation 1993;88:819–828.
2. McDermott MM, Greenland P, Liu K, Guralnik JM, Celic L, Criqui MH, Chan C, Martin GJ, Schneider J, Pearce WH, Taylor LM, Clark E. The ankle brachial index is associated with leg function and physical activity: the Walking and Leg Circulation Study. Ann Intern Med 2002;136:873 –883.