Letter

Pulse wave velocity in buerger's disease

To the editor,

Pulse wave velocity (PWV) is directly related to arterial wall thickness and stiffness,[1] hence it gives information about the arterial functions.[2] Therefore, this study was aimed to find out PWV in Buerger's disease affecting lower limbs[3] (aseptic inflammation and thrombosis of arteries and veins).

In this study, PWV was recorded in 15 males having Buerger's disease (mean age 32.16 ± 6.84 years) of 1-6 years duration, and was compared with 15 age-matched control male subjects. Excluded from the study were patients having either history, examination or investigations suggestive of: cardiac disease, collagen disorders, diabetes, hypertension, atherosclerosis, intake of beta blockers or vasodilators, and bilateral absence of dorsalis pedis artery. History of smoking was present in all subjects. However, all subjects were told not to smoke one day prior to examination.

Pulse wave velocity was recorded by means of pulse transducers with built-in photodetectors and light sources. The subjects were made to lie in supine position and 2 transducers were placed and strapped in position. One transducer was placed and strapped over the femoral artery (FA) just below the inguinal ligament, and the other over the dorsalis pedis artery (DPA). Simultaneous recordings of arterial pulse from above mentioned sites were made on two channel polygraph (Polyrite, INCO), at a paper speed of 50 mm/sec. The length of arterial segment (L) between FA and DPA was also measured. The time delay (T) between the onset of pulse wave between FA and DPA was recorded, and expressed in milliseconds. At least five recordings were taken and averaged. Pulse wave velocity (m/sec) was calculated by using formula (L/T),[2] and was noted from both lower limbs even if one limb is involved more than the other. Statistical analysis was done by 'unpaired t' test.

There was significant ($P < .001$) increase in heart rate in Buerger's patients without any variation in blood pressure. The PWV in lower extremities in FA – DPA segment showed considerable increase ($P < .001$) in Buerger's compared to age matched control group (Table 1, Figure 1). There was no relationship between the increase in PWV and the duration of Buerger's disease.

Table 1. Pulse wave velocity in control and Buerger's disease

Parameter	Control	Buerger's disease	*P* value
1. Heart Rate (beats/min)	78.73±13.88	95.74±5.48	<0.001
2. Blood pressure (mm of Hg)			
Systolic	115.63±12.17	107.77±9.71	<0.05
Diastolic	72.72±6.78	74.44±11.30	NS
3. PWV (m/sec)	6.3±0.17	8.5±1.73	<0.001

$P < .001$ = significant, NS = non significant

Clinical criteria provides much information about vascular insufficiency but difficult to quantitate.

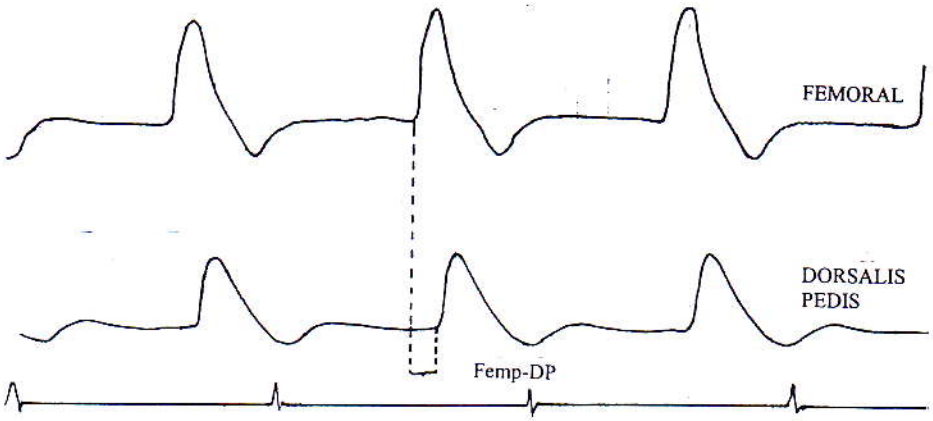

Figure 1. Recording of femoral and dorsalis pedis pulse
Fem-Dp = Time delay "T" between their onset

Functional status of blood vessels can be evaluated by PWV. Increased PWV relects stiffening of arteries. The PWV is found increased with age, in coronary artery disease, diabetes and atherosclerosis.[2] However, there is controversy on PWV in arteriosclerotic peripheral vascular diseases. It is reported that arteriosclerosis may have no effect or an effect similar to that of aging[2] or decrease the PWV[4] due to diversion of blood to smaller collateral vessels.[5] PWV in lower extremities in FA-DPA segment showed significant increase in Buerger's versus controls. Tachycardia, as occurred in this study, has no effect on PWV.[2] Hypertension has been reported to increase PWV,[4] but all Buerger's patients in this study were normotensive. Therefore, the increase of PWV in Buerger's patients may be due to inflammation of arteries[3] which may cause changes in arterial wall leading to increased PWV.

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References

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