

[Indian Heart J.](#) 2004 Mar-Apr;56(2):123-8.

Terminalia arjuna reverses impaired endothelial function in chronic smokers.

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Source

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Abstract

BACKGROUND:

Smoking, largely through increased oxidative stress, causes endothelial dysfunction which is an early key event in atherosclerosis. Smoking cessation and antioxidant vitamin therapy are shown to have beneficial role by restoring altered endothelial physiology. The present study was aimed to determine whether Terminalia arjuna, an Indian medicinal plant with potent antioxidant constituents, would improve endothelial dysfunction in smokers.

METHODS AND RESULTS:

Eighteen healthy male smokers (age 28.16 \pm 9.45 years) and equal number of age-matched non-smoker controls participated in the study. The baseline brachial artery reactivity studies were performed using high frequency ultrasound according to standard protocol under identical conditions to determine endothelium-dependent, flow-mediated dilation and endothelium-independent nitroglycerine-mediated dilation. The two groups were matched regarding age, body mass index, blood pressure, serum cholesterol, mean resting vessel diameters and post-occlusion flow velocities (all p=NS). While flow-mediated dilation was significantly impaired amongst smokers compared to controls (4.71 \pm 2.22 v. 11.75 \pm 5.94%, p <0.005), the nitroglycerine-mediated dilation was similar in the two groups (20.35 \pm 3.89 v. 19.68 \pm 3.74%, p=NS). Subsequently the smokers were given Terminalia arjuna (500 mg q8h) or matching placebo randomly in a double blind cross-over design for two weeks each, followed by repetition of brachial artery reactivity studies to determine various parameters including flow-mediated dilation after each period. There was no significant difference as regards vessel diameter and flow velocities between the two therapies. However, the flow-mediated dilation showed significant improvement from baseline values after Terminalia arjuna therapy but not with placebo (9.31 \pm 3.74 v. 5.17 \pm 2.42%, p <0.005).

CONCLUSIONS:

Smokers have impaired endothelium-dependent but normal endothelium-independent vasodilation as determined by brachial artery reactivity studies. Further, Terminalia arjuna therapy for two weeks leads to significant regression of this endothelial abnormality amongst smokers.

PMID:

15377133

[PubMed - indexed for MEDLINE]

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