Smoking and Thromboangitis Obliterans– Are they related ?

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ABSTRACT

Introduction: In 1908 Leo Buerger first gave the world the clinical picture of this dreadful disease which he called Thromboangitis Obliterans. Virtually all investigators believe that smoking or tobacco use in some form is a requirement for the diagnosis of Thromboangitis Obliterans. We studied the demographic profile and smoking pattern of patients with Thromboangiitis Obliterans.

Methods: Retrospective study carried out in a tertiary level hospital of South India from 1st January 1997 to 31st December 2003. Patients fulfilling Shionoya's criteria form the study group. Incidence of Thromboangitis Obliterans, relation to smoking habits, type and nature of manifestation were analyzed.

Results: A total of 105 cases were studied and found to have declining pattern of incidence from 0.9%-0.3%. All patients were males, smokers at the time admission and 76% out of them were from low socioeconomic background. Patients smoking 5-15 cigarettes per day, for 5-10 years duration constituted 45% of the study group. The most frequent reasons for being referred to hospital were ischemic ulcers (83.80%), claudication (78.0%) and rest pain (26.66%).

Conclusions: In those who present early with the disease the number of cigarettes and duration of smoking shows no direct correlation to the severity. Most patients continue to smoke inspite of counseling and awareness that the disease progresses due to smoking. Ulcer, intermittent claudication and rest pain are the three common presenting symptoms of Thromboangitis Obliterans.

Keywords: *smoking; thromboangitis obliterans.*

INTRODUCTION

Thromboangitis obliterans (TAO) is a non-atherosclerotic segmental inflammatory disease that most commonly affects the small and medium sized arteries and veins in the upper and lower extremities. Tobacco is attributed to play a central role in both the initiation and continuation of the disease. TAO most frequently occurs between the ages of 25-40 years. Formerly considered to be exclusively a disease of the male, recent reports show that there is an increase in the incidence of the disease in the female, consistent with the increase in their smoking habits. The reported incidence of Buerger's disease in women was 1% to 2 % in most published

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series of cases before 1970. TAO is known to occur the world over, and no race or color is known to be immune to this disease.[1] Most studies have reported a preponderance of patients in the low socioeconomic strata of society, particularly farmers.[2] However no particular occupation is implicated. Also, geographic location and climatic condition are questionable factors.

Although TAO occurs most commonly in the infrapopliteal and brachial arteries, it is not uncommon to see involvement of the superficial femoral artery. No region of the extremity (both upper and lower) is exempt. There are widely varying prevalence rates of Buerger's disease in patients with peripheral arterial disease in Europe and Asia. For example, the rates of TAO among all patients with peripheral arterial disease have been reported in 0.5% to 5.6% in Western countries. 3% in Poland, 6.7% in East Germany, 11.5% in Czechoslovakia, 39% in Yugoslavia, 80% in Israel, 45% in India and 16% to 66% in Korea and Japan.[3,4] Several different diagnostic criteria have been proposed for the diagnosis of TAO. Papa and Adar[5] have put forth various clinical, angiographic, histopathologic, and exclusionary criteria, and in a second report, they suggested a point scoring system to help make the diagnosis of Buerger's disease. Mills and Porter[6] have proposed major and minor diagnostic criteria for the diagnosis of Buerger's disease. Wong's[7] Last RJ[8] and S. Shinoya[9] proposed different clinical criteria to diagnose TAO respectively. Apart from clinical criteria several pathological and imaging criteria have been suggested by various authors.

We have attempted to study the relationship between the incidence of TAO and smoking habits in the population studied.

METHODS

In this retrospective clinical study, we studied patients admitted to the various surgical units of Kasturba Hospital, Manipal India. The period of study is 7 years from 1st January 1997 to 31st December 2003. The total number of patients in this study is 105. Admission per year ranged from 8 to 23 with a mean of 16 patients per year. Among the patients with peripheral arterial occlusive disease, only those satisfying Shinoya's criteria were included in this study. We analyzed the incidence, relation to smoking habits, type and nature of manifestation as compared with the data available in the literature. It was with this background that we

embarked on this retrospective clinical study to obtain data for analysis and comparison with the literature.

RESULTS

In our study all 105 patients were male (100%). Four patients were business men, 12 were in services and the remaining 84 patients were from the low socio economic groups, including manual laborers, farmers, fishermen and beedi workers. There was no record of the occupation for five patients. In this study its yearly incidence, age, number of cigarette smokers, duration of smoking, and presentation with rest pain, intermittent claudication and ulcer are as shown in Table 1-5.

Table 1. Yearly incidence of patients.

Year	1997	1998	1999	2000	2001	2002	2003	Total
No.of patients	23	20	17	15	13	8	9	105
Incidence	0.8%	0.7%	0.7%	0.6%	0.4%	0.3%	0.4%	

Table 2. Distribution of age group.

	Age groups in years			Total
Range	21 – 30	31 – 40	41 - 50	
No. of patients	19 (18.09%)	51 (48.57%)	35 (33.33%)	105 (100%)

In our retrospective study we had used 50 years as the upper age limit in the inclusion criteria. Patients were divided into three groups: 21-30 years, 31-40 years and 41-50 years.

Table 3. Incidence of smokers.

No. of admissions	No. of patients smoking		Total
	Smoker	Non smoker	
Second admission	20(19.04%)	12(11.42%)	32 (30.47%)
Three or more admissions	15 (14.28%)	12 (11.42%)	27 (25.71%)

Table 4. Number and duration of smoking.

No. of cigarettes	Duration of smoking in years				Total
	2-10	11-20	21-30	31-40	
5-15	45 (42.85%)	19 (18.09%)	2(1.90%)	Nil	66 (62.85%)
16-35	7(6.66%)	19 (18.09%)	2(1.90%)	1 (0.95%)	29 (27.61%)
>36	2(1.90%)	2(1.90%)	5(4.76%)	1 (0.95%)	10(9.5%)
Total	54 (51.42%)	40 (38.09%)	9(8.57%)	2 (1.90%)	105 (100%)

Table 5. Distribution of clinical features.

Total	No. of admission			Total
	First	Second	Thirdor more	
No. of patients	105 (100%)	32 (30.47%)	27 (25.71%)	164
No. of claudicants	51 (48.57%)	17 (16.19%)	14 (13.33%)	82
Ulcer present	53 (50.47%)	21 (20.0%)	14 (13.33%)	88
Rest pain present	25 (23.80%)	Nil	3 (2.85%)	28

DISCUSSION

In this retrospective study, 105 patients admitted in various surgical units diagnosed to have TAO using Shionoya's[9] criteria form the study group. The reported incidence of Buerger's disease varies widely. In the series of Som,[10] Ruberti et al and Allen et al, it was 0.6%, 0.25% and 0.4% respectively. In our series there is a definite declining trend from a maximum of 0.9% in the year 1997 to 0.3% in the year 2002. This seems a global phenomenon. It may be due to the improvements in the socio economic conditions, decrease in the smoking habit (especially in patients made aware of the harmful effects of smoking when they come with the initial minor symptoms), and decreasing use of traditional locally manufactured cigarettes. This observation may also be due to referral patterns prevailing regionally. Large hospitals, some with vascular surgical departments may have attracted patients from this hospital's traditional catchment area. Differing criteria used for diagnosis makes comparison with other published series difficult. Available literature supports our finding that TAO is essentially a disease of the young. In the Rao. A. S. et.al[11] report, the youngest patient was 16 years old and the oldest 41 years. Buerger in 1924 had reported the mean age at diagnosis as 32.5 years. In our series, upper age limit for inclusion was 50 years. The youngest patient was

22 years old. 50% of the patients were in the age group of 31-40 years, with the mean age at diagnosis 37.55 years. Though many case reports exist with patients diagnosed with TAO out of this range, we did not study any patient above 50 years who had peripheral arterial occlusive disease. Hence, we cannot comment on the possibility of the disease existing in patients above the age of 50 years. It is however prudent to obtain strong pathological evidence if the diagnosis is to be considered in patients above the age of 50 years.

In early published reports TAO was most commonly encountered in young men. Rao et al. reported in their series all patients to be male. However in the later literature incidence of TAO appears to increase in woman. Before 1970, females diagnosed to have TAO constituted only 1-2% of all patients. But after 1990 most published series demonstrated a much higher occurrence in woman, most likely related to the increasing incidence of smoking amongst women. Buerger in 1924 reported the incidence TAO in females as 0.4%. Goodman et.al[12] in 1965 reported 2.5%, and Rao et.al[11] in 1975 reported 0%. In our study all patients were male. The rarity of TAO in woman may be because of smoking being rare in the female population regionally. Even amongst female smokers the number of cigarettes smoked is less than their male counterparts. Also the possibility of female hormones being protective against TAO should also be considered.

Patients diagnosed to have TAO from India and Indonesia has mostly been from low socio economic backgrounds. This however was not substantiated by studies from Israel by Goodman et.al[12]. However Rao A.S. et.al[11] demonstrated all 100% belonging to the lower socio economic groups. In our study 76% of patients were from low socioeconomic background. Since the time of Buerger, literature reports an extremely strong association between heavy tobacco use and TAO. Virtually all investigators believed that smoking or tobacco use is in some form is a requirement for the diagnosis of TAO. Rao A.S. et.al[11] demonstrated all patients except one were heavy smokers. In 1978 A.L.Som[10] attributed TAO to a tobacco factor which leads to severe segmental vasospasm and later intravascular thrombosis. He also divided the smokers

and found that the disease appeared earlier in heavy smokers within 3 to 10 years, late in mild smokers within 18 to 22 years and moderate occupied the place between the two.

In our series the disease appeared early in 49 patients (45%) who smoked (5-15 cigarettes) per day, for minimum duration of (5-10 years) of smoking. In our study, the number of cigarettes and the duration of smoking show no correlation in the early presentation of Buerger's disease. This contradicts with other studies. The reason may be that smoking may or may not be the sole primary etiological factor otherwise all heavy smokers in the world would have been exposed to the risk of TAO. Tobacco use may be central to initiation and progression of the disease. There possibly are other factors, which play some role as triggering mechanism for development of TAO in susceptible individuals. So the number of cigarettes or the duration of smoking may not be criteria that are helpful to diagnose TAO. One should temper this observation from a retrospective study with the possibility of under-reporting of smoking habits, in particular the number of cigarettes smoked. It is a common observation amongst our surgical patients who report they have quit smoking that it was since the hospital admission.

Counseling the patient aggressively on the importance of discontinuing the use of all tobacco products as well as to avoid passive smoking is the cornerstone of therapy. Although in our study 17.2% of the patients quit smoking after counseling, no markers like urine nicotine and cotinine estimation were used to biochemically verify the truth. Among 164 admissions in the 105 patients of the study group, 12 (11.42%) patients in second admission and 12 (11.42%) patients in the third or more admissions, quit smoking, but still 20 (19.04%) patients in second admission and 15 (14.28%) patients in third or more admissions, were still smoking. It seems vigorous counseling at the time of diagnosis and first admission did motivate a number of patients to quit smoking, which is the first measure to be adopted for treatment.

CONCLUSIONS

Ulcer, intermittent claudication and rest pain are the three common presenting symptoms of TAO. The incidence of TAO is declining, commonly affecting male smokers between 31 and 50 years. Smoking habits have wide variation varying with the region where studies are conducted.TAO occurs more frequently in the low socioeconomic groups. In those with an early presentation of TAO the number of cigarettes and duration of smoking show no direct correlation to the disease. Most patients continue to smoke inspite of counseling and awareness of disease progression due to continued smoking.

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