Angiographic Pattern and Final Outcome of Peripheral Vascular Disease

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Objective: To evaluate the angiographic pattern of peripheral vascular disease and risk in adult patients.

Design: A Retrospective Study.

Setting: Salmaniya Medical Complex, Bahrain.

Method: Ninety-nine patients had angiography of the lower limbs from May 2006 till December 2007. Only 28 patients were included in the study because of the availability of the records. The following data were documented: age, nationality, gender, angiogram review and location of the occlusion, DM and smoking habits, treatment and outcome, and intermittent claudication.

Result: Twelve (43%) had amputation; 14 (50%) underwent revascularization and two (7%) refused further management. Twenty-three (82%) patients were critical and 5 (18%) had disabling intermittent claudication.

Conclusion: The main angiographic pattern of patients with peripheral vascular disease involves the infra-popliteal arterial system, whether isolated or combined. The major high-risk factor was found to be diabetes mellitus for lower limb arterial occlusive disease.

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Arterial occlusion disease is a rising problem in developing countries as a result of an increase in the median life span and the prevalence of risk factors. It is an important healthcare problem and is an indicator of widespread atherosclerosis in other vascular territories, such as the cerebral and coronary circulations. Twenty-seven million people are affected in North America and Europe, with 88,000 hospitalizations involving the lower extremities[1]. Now with the emergence of diagnostic tools which can identify the level and extent of arterial occlusion, it has become easier to plan the revascularization procedure and predict the outcome of the disease.

It has been found that there is ethnic variation in peripheral vascular disease patterns. Makin et al found that atherosclerosis PVD is less common among Indo-Asians and Afro-Caribbean's than Caucasians[2].

However, it was noticed that the amputation rate, whether minor or major, in ischemic limbs is persistently high in patients presenting to Salmaniya Medical Complex compared to the other countries.

The aim of this study is to evaluate the angiographic pattern of peripheral vascular disease and risk in adult patients.

METHOD

The study was performed from May 2006 to December 2007 for all patients who had an angiogram of the lower limbs. The medical records in the angiogram suite for patients who had lower limb angiograms were reviewed. The angiography films were reviewed by a consultant vascular surgeon.

All patients who had angiogram of lower limbs due to peripheral vascular disease including disabling intermittent claudication and critical lower limb ischemia (critical limb ischemia is defined as rest pain or tissue loss with absent peripheral pulses) were included.

All patients who had an angiogram of the lower limb for trauma and patients with incomplete data were excluded.

The anatomic occlusion level was classified into supra-inguinal, infra-inguinal, and combined infra and supra-inguinal lesions. The infra-inguinal arterial occlusion is further subdivided into supra-popliteal, infra-popliteal, and combined supra and infra-popliteal lesions. The data were analyzed using descriptive statistics by IBM SPSS.

RESULT

Ninety-nine patients had angiography from May 2006 to December 2007; 36 angiography films were found and only 28 patient files were found among those. Out of 28 patients, there were 24 (85.7%) males and 4 (14.3%) females. The median age was 57.5 (45-70). Twenty-five (89.3%) were Bahraini while 3 (10.7%) were non-Bahraini.

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Twenty-three (82%) patients were clinically critical and 5 (18%) had disabling intermittent claudication.

The arterial occlusion level among the patients was as follows: 26 (93%) were isolated infra-inguinal, no isolated supra-inguinal, and 2 (7%) were combined supra and infra-inguinal.

Among the infra-inguinal lesions, 8 (28.5%) patients had isolated supra-popliteal, 3 (10.7%) patients had isolated infra-popliteal, while 17 (60.7%) patients had combined supra and infra-popliteal. Twenty (71%) patients had an infra-popliteal disease. Eighteen (71%) patients had DM, 13 (46%) were smokers, 11 (39%) had hypertension and 3 (10%) had hyperlipidemia.

Twelve (43%) patients underwent amputation, 14 (50%) patients underwent revascularization and 2 (7%) patients refused further management.

DISCUSSION

The study revealed that majority of the patients were males (88%) with chronic peripheral vascular disease and most of them presented with critical lower limb ischemia (82%). The majority were infra-inguinal, and there were no supra-inguinal arterial lesions. The majority were combined infra-inguinal lesions. Forty-three percent of our patients required amputation. The most common risk factor found among our patients was DM followed by smoking.

The high rate of amputation in our patients is most likely due to DM leading to a high prevalence of non-reconstructable arterial occlusion resulting in amputation. Ciavarella et al found that DM patients tend to have obstructions in the infra-popliteal arteries compared to non-DM patients who present with occlusion of aortoiliac and femoropopliteal arteries[3].

Menzoian et al found that DM patients had occlusion, particularly in the peroneal and posterior tibial arteries[4]. He also found that diabetics present more frequently with gangrene or ulcer compared to non-diabetic smokers. However, smokers present earlier than non-smokers. Intermittent claudication was associated with smoking[4].

Diehm et al found that both DM and RENAL impairment are associated with an atherosclerotic change of the pedal arch[5]. The presence of RI is associated with lower patency of the pedal arch compared to DM alone, more than 50% of patients were unfit for distal bypass grafting[5].

Fglia et al found that the risk of major amputation increases significantly when total occlusion is present in the popliteal and infra-popliteal arteries. No major amputation was carried out in patients with angiographic scores < 10; major amputation was carried out in all the patients with scores >14. They concluded that angiography permits an exact detection of occlusive arterial disease in subjects with normal results for non-invasive vascular procedures[6].

Ethnicity seems to play a major role in the Bahraini community as the majority of non-Bahraini populations are of the Indo-Asian race. Makein et al found atherosclerotic PVD is generally less prevalent in Indo-Asians and Afro-Caribbeans than in Caucasians[2]. Hobbs et al found that abdominal aortic aneurysm appears to be more predominantly a disease of Caucasians, Blacks and Asians have a tendency to distal occlusive disease[7].

The study was limited by the poor record-keeping in the hospital resulting in the unavailability of many records. We were able only to include a small subset of our intended population (28%).

CONCLUSION

The main angiographic pattern of patients with peripheral vascular disease in this study involves the infra-popliteal arterial system, whether isolated or combined. It is most likely secondary to DM. The outcome of the infra-popliteal pattern on angiogram is very poor due to the limited surgical options. Further studies are required to establish the angiographic pattern, risk factors and outcome of PAD is needed.

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