**RESEARCH ARTICLE**

**MEASUREMENT THE DIAMETER OF ABDOMINAL AORTIC AND FEMORAL ARTERY FOR DIABETIC AND HYPERTENSIVE PATIENTS IN CTA USING MDCT**

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**ARTICLE INFO**

**ABSTRACT**

This study concern the measurement of the diameter of abdominal aorta at its bifurcation to right and left femor artery, for diabetic patients and hypertensive patients and normal as control group using Multi Detector Computed Tomography MDCT 64 slice. Information was available for 300 patients, 100 patient’s diabetics, 100 hypertensives and 100 normal as a control group, Diameter measurement of abdominal aortic at its bifurcation to right and left femor artery and the study sample diabetic patients and hypertensive and control group a normal; the average diameter of normal femoral artery was (7.96 mm) which is bigger than that of hypertensive patients (7.41 mm) and diabetic (5.91 mm) patients, for abdominal aorta bifurcation of hypertensive patients the diameter was (17.18 mm) which is bigger than the normal (16.47 mm) and diabetic patient’s which is (14.89 mm). Diameter of abdominal aorta and its bifurcation to left and right femoral artery show that the hypertensive patients showed bigger diameter than the normal and diabetic patients, and the dimension of left and right femoral artery the normal patients showed bigger diameter than hypertensive and diabetic patients.

**INTRODUCTION**

For many decades, invasive digital subtraction angiography (DSA) has been accepted as the gold standard technique for vascular imaging and for peripheral artery disease (PAD) evaluation. However, DSA only provides a two-dimensional view of the vessels, which may underestimate the degree of stenosis for eccentric lesions and tortuous vessels. Moreover, DSA has non-negligible risks associated with arterial puncture, iodinated contrast medium and ionizing radiation. At this point, it is easy to understand that recent and rapid developments in non-invasive techniques as computed tomography angiography (CTA) and magnetic resonance angiography (MRA) are replacing DSA in the diagnostic algorithm for PAD. In fact, DSA is nowadays primarily reserved for patients undergoing therapeutic endovascular interventions rather than purely diagnostic studies (Tendera, 2011). Both CTA and MRA allow us to obtain high-resolution multplanar and three-dimensional images of the peripheral arteries in a noninvasive approach. Similarly, both are accurate techniques for evaluating PAD severity, with excellent (~95%) sensitivities and specificities compared to the accepted standard DSA (Jens et al., 2013; Pollak et al., 2012 and Cao et al., 2011). Thus, the individual use of each modality depends on local availability, medical expertise, patient’s characteristics (e.g. diabetes, renal insufficiency, implanted metal devices, prior bypass grafts, etc.), costs and information required. We facilitate a brief summary of the current state of both techniques from a clinical point of view, highlighting the strengths and limitations of each modality. The widespread availability of multidetector scanners has helped overcome the limitations of the older generations. Shorter acquisition times, thinner slices and higher spatial resolution reduce respiration and motion artefacts, allow visualization of smaller and distal vessels, and enable scanning of the entire vascular tree in a limited period with a decreasing (but still substantial) amount of contrast medium and radiation burden (Iglesias, 2014; Baim, 2006 and Poletti et al., 2004). The limitation of CTA is mainly the evaluation of severely calcified lesions, where the high attenuation induces blooming artefact that results in an overestimation of stenosis. This effect becomes more relevant in small vessels (such as the infra poplitical vessels), leading to a lower diagnostic performance of CTA in tibial disease than in aorta iliac and femoral levels. The two main disadvantages of CTA are the need for potentially nephrotoxic contrast agents (median 100-120 ml) and radiation exposure (average radiation dose reported 7.5 mSv) (Iglesias, 2014; Baim, 2006).
Peripheral arterial disease (PAD) is atherosclerosis leading to narrowing of the major arteries distal to the aortic arch. The diagnosis of PAD is challenging in patients with diabetes for a number of reasons. Firstly, co-existing symmetrical distal polyneuropathy, present in a significant proportion of patients with diabetes and particularly those with foot ulceration, may mask symptoms of PAD such as intermittent claudication and ischemic rest pain. Patients may therefore present at a more advanced PAD stage than their non-diabetic counterparts (Apelqvist et al., 2012). Physical examination is of limited value (Schaper et al., 2002) and does not provide reliable information to determine whether PAD is present nor does it reliably assesses its severity. Oedema, neuropathy and infection, frequently co-existing in the presence of ulceration, make the clinical assessment for PAD difficult and may hamper the performance of diagnostic tests for PAD. Moreover, the greater prevalence of medial sclerosis (medial arterial calcification) among patients with diabetes can render pedal arteries incompressible on cuff in ation during external arterial pressure measurements such as with ABI or toe pressures (Jeffcoate et al., 2009). There are few robust data on the usefulness of tests to diagnose or rule out PAD, including ABI, in diabetes and particularly in those with ulcerated feet. The aim of this systematic review was to evaluate the performance of index non-invasive diagnostic tests against reference standard imaging techniques for the detection of PAD among patients with diabetes. Peripheral arterial disease in patients with diabetes adversely affects quality of life (Jeffcoate, 2009) and is associated with substantial functional impairment (Munger et al., 2004). The reduced walking speed and distance associated with intermittent claudication may result in progressive loss of function and long-term disability (Ness et al., 1999 and Beckman et al., 2002). With more severe disease, critical limb ischemia (CLI) may develop, resulting in ischemic ulceration of the foot and risk of limb loss (Khaira et al., 1996 and Vogt et al., 1994). Importantly, PAD is associated with a substantial increase in the risk of fatal and non-fatal cardiovascular and cerebrovascular events, including myocardial infarction (MI) and stroke (American Diabetes Association, 2003 and McDermott et al., 2004). Patients with diabetes and PAD are at higher risk of lower extremity amputation than those without diabetes (Hiatt et al., 2002). Furthermore, cardiovascular and cerebrovascular event rates are higher in diabetic individuals with PAD than in comparable non-diabetic populations (Ness et al., 1999). Although much is known about PAD in the general population, the management of PAD in those with diabetes is less clear. Recently, the American Diabetes Association (ADA) issued a consensus statement that provides guidelines for the diagnosis and management of PAD in patients with diabetes (Ness et al., 1999). The purpose of this article is to review the consensus statement and to discuss the treatment options available to help prevent future ischemic events in diabetic individuals with PAD. Patients with diabetes are clearly a high-risk group of individuals who are at risk of developing extensive vascular disease requiring a multi-discipline approach. Cardiovascular healthcare providers have a unique opportunity to reduce the disease burden in this population.

MATERIAL AND METHODS

The study was performed on 300 consecutive patients in Khartoum state, MDCT 64 slice Toshiba All investigations were done with the subject in the supine position. The maximal anteroposterior diameter was registered with the CT machine for bifurcation and the right and left branches. CTA allows identification of the aneurysm and differential diagnosis from ectasia (caliber increasing less than 50%), the description of the lesion, evaluating location, length, extension, transverse diameter (valuated always perpendicularly to major vascular board), presence of calcifications and location of thrombotic apposition (concentric/ eccentric) measuring its maximum thickness, evaluating the look of its edges and excluding the possible presence of perversity that can suggest an instable nature of the thrombus.
RESULTS

Table 1. show statistical description of normal and diabetics patients

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Table 2. Show independent sample T-Test for equality of means for normal and diabetics patients

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Table 3. show statistical description of normal and hypertensive patients

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Table 4. show independent sample T-Test for equality of means for normal and hypertensive patients

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DISCUSSION

Measurement of abdominal aorta at its bifurcation to left and right femoral artery for normal, diabetic and hypertensive patients in regard to 300 patients with Computed Tomography
measurement for the left and right femoral artery, the diameter of normal bigger than the diameter of hypertensive and diabetic patients, but significant in case of diabetic patients, for abdominal aorta bifurcation the hypertensive patients showed slightly bigger diameter than normal and diabetic patient’s diameter was smaller but this differences were inconclusive.

Conclusion

Measurement diameter of abdominal aortic at its bifurcation to right and left femur artery and the study sample diabetic patients and hypertensive and control group (normal), the diameter of left and right femoral artery, the diameter of normal bigger than the diameter of hypertensive and diabetic patients, but significant in case of diabetic patients, for abdominal aorta bifurcation the hypertensive patients showed slightly bigger diameter than normal and diabetic patient’s diameter was smaller but this differences were inconclusive.

REFERENCES


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