Original Article

Pattern of Presentation of Coronary Artery Disease in Hypertensive Patients.

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Abstract

Background: Hypertension is a major risk factor for coronary artery disease (CAD) and left ventricular hypertrophy (LVH). Hypertensives have a threefold increase in cardiac death (due to either CAD or to cardiac failure).

In Sudan hypertension complications were increasing in incidence and prevalence. Evaluating chest pain in hypertensive patients presents challenges because of left ventricular hypertrophy as a cause of chest pain besides CAD. There are limited data on different aspects of hypertension complications.

Objectives: To assess the CAD as a cause of chest pain, to see the pattern and severity of CAD and to find the correlation between ECG, ECHO and coronary angiography findings in hypertensive patients

Methodology: 135 known hypertensive patients presented with chest pain were assessed through ECG, ECHO and coronary angiography.

Results: The participants' ages ranged between 39 and 90 years, with mean age of 59 years .73.3% of them were found to have CAD. The left anterior descending (LAD) artery was the most involved one. Left main (LM) artery was the least involved. Electrocardiography (ECG) showed that LVH is found in more than 50%of patients with CAD. BMI was >25 in 41.5%. Percutaneous coronary intervention (PCI) was recommended in (31.4%), coronary artery bypass graft (CABG) in(21.6%). 33% and 25% of these consecutively have hypertension for 10 years or more.

Conclusion: CAD is the main cause of chest pain in hypertensives. Aging, body mass index, duration and magnitude of hypertension and LVH have strong and frequent association with CAD.

Key words: ventricular hypertrophy, atherosclerotic, cardiovascular.

Hypertension, either systolic/diastolic or isolated systolic, is considered a major risk factor for coronary artery disease (CAD). Hypertensives have a threefold increase in cardiac death (due to either coronary events or to cardiac failure) [1].

CAD in hypertension is due to increased tendency to hypertrophic activity in vascular tissue and exaggerated development of the underlying atherosclerotic lesions[2].

Hypertension is also an independent risk factor for left ventricular hypertrophy (LVH). Within five years of the appearance of LVH in hypertensive; one can expect mortality rates of 33% for men and 21% for women.

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The presence of ECG-LVH increases the risk of cardiovascular disease nearly 3-fold. Echo-LVH has been reported to be an independent risk factor for mortality and cardiovascular events[3].

In Sudan hypertension with its complications is increasing in incidence and prevalence[4]. There is limited data on hypertension and its complications in Sudan.

Evaluating chest pain in hypertensive patients presents challenges because LVH is a cause of chest pain and shortness of breath besides coronary artery disease[5].

The objectives of this study are to assess the CAD as a cause of chest pain ,to see the pattern and severity of CAD and to find the correlation between ECG, ECHO and coronary angiography findings in hypertensive patients.

Methodology:-Through a descriptive study that was conducted at (Ahmed Gasim Hospital) within the period Feb-Oct.2009, 135 known hypertensive patients presenting with chest pain were evaluated. Smokers, diabetic and patients with family history of CAD were excluded. Subjects' ages, gender, duration of hypertension and recurrent BMI were considered as independent variables. CAD was assessed through abnormalities in ECG, echo and cardiac catheterization. The data were collected through self structured questionnaire, after giving a verbal consent. The study has been approved by the ethical committee.

Results*:* 60.7% of the patients were males. Coronary angiography results showed that 73.3% of the patients have CAD, of whom 26.7% have three coronary vessel disease (3VD) table1.

Table 1: Frequency of vessel diseases in our patients

	Frequency (%)
Normal	36 (26.7)
SVD	34 (25.2)
2VD	29 (21.5)
3VD	36 (26.7)
Total	135 (100.0)

SVD: single vessel disease. 2VD: two vessel disease .3VD :three vessel disease.

The participant ages ranged between 39 – 90 years old, with mean age of 59 years, and SD of 10 years. (P-value for T-test is 0.248).

All the subjects were diagnosed for systemic hypertension for periods ranging between 6 months and 30 years, with a mean duration of 10.4 years and SD of+- 6 years. Fig. 1

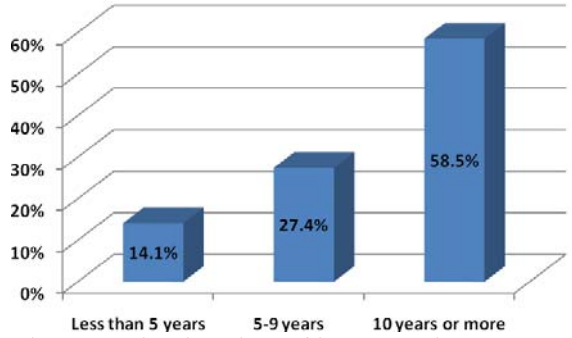

Figure1: The duration of hypertension.

In 24.4% the BMI was <24.9 .in 41.5% the BMI was 24.9-29.9 in 33.I% the BMI was> 30 Fig. 2.

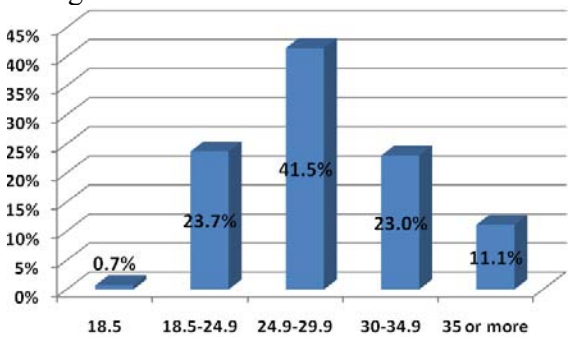

Fig. 2: BMI in ourpatients.

As shown in table2 the LAD was the most involved followed by the RCA then the CX, the LM was the least involved.

Table2 LM: Left main, LAD: Left Anterior Descending, CX: circumflex, RCA :right coronary artery

Artery	Normal	<50% lesion	>50% lesion
LM	94.8	4.4	0.7
LAD	37.8	11.1	51
CX	66.7	3.75	29.65
RCA	50.4	9.6	40

only 13.3% of the normal coronary angiography has ECG LVH while 27.7% has 2VD and 27.7% has SVD Fig. 3

The overall ranking of severity as assessed through the recommendation for treatment was- *PCI* in (31.4%), *CABG* in (21.6%), 33% and 25% of these consecutively have hypertension for more than 10 years (Fig4 &Fig 5)

Discussion: CAD is the main cause of chest pain in hypertensive patients.

Aging, body mass index, duration and magnitude of hypertension and (ECG) LVH have strong and frequent association with CAD.

Aging is strongly associated with CAD results in this study and this is comparable with the PROCAM study where aging was found to be associated with an increase in total (and renal vascular) resistance[6, 7]

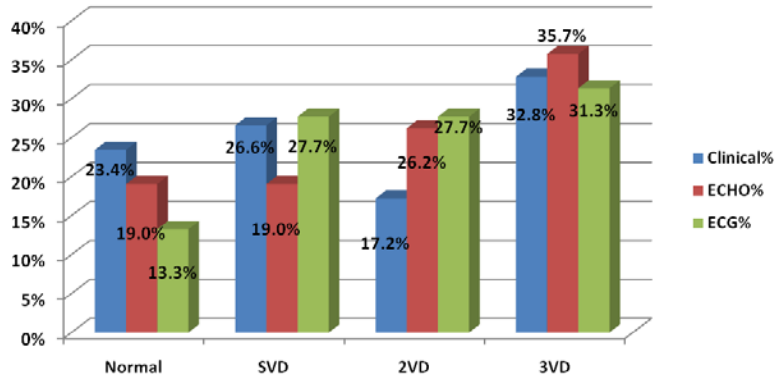

Figure3: coronary angiography.

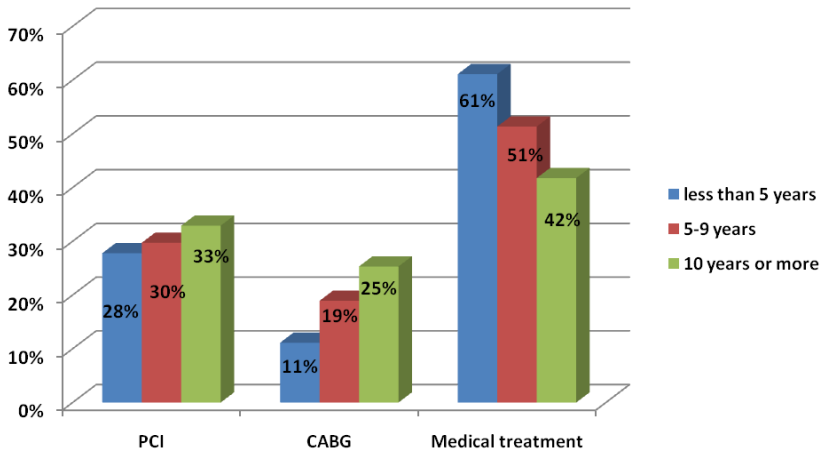

Figure 4: Ranking of severity.

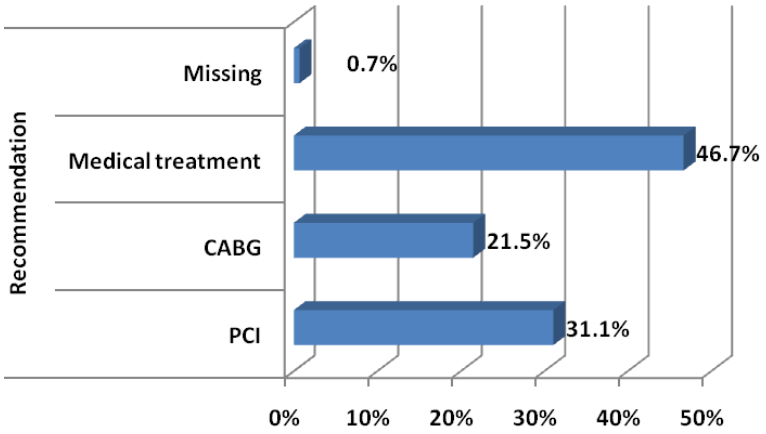

Figure 5: recommendation for treatment.

Duration of hypertension with the poor control and lack of compliance with medication is directly related to severity of CAD as in other studies. The duration and magnitude of hypertension does have an impact in the incidence of coronary heart disease [8, 9]

Increased BMI due to lack of awareness with life style measures, increases the risk of CHD by about 75% in both men and women[10].

The LAD is the commonly involved artery due to many factors mainly the bulk of muscles supplied[10].

Strong association between ECG LVH and CAD was found. These results are comparable with the data from the Second National Health and Nutrition Examination Survey (NHANES II) that the presence of ECG LVH is a strong predictor of future cardiovascular death[11].

Conclusions

The main cause (73.3%) of chest pain in hypertensive patients was found to be CAD. Aging, body mass index, duration and magnitude of hypertension have strong and frequent association with CAD .The LAD was the most involved followed by the RCA then the CX ,the LM was the least . ECG LVH is strongly associated with CAD more than ECHO LVH.

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