



Clinical Profile and Angiographic Characteristics in Patients with Wellens Syndrome

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ABSTRACT

BACKGROUND: The purpose of this study was to investigate the demographic profile, risk factors, and angiographic findings in patients with Wellens Syndrome.

METHODS: This study was carried out at the Department of Medicine, Green city Hospital, Dhantoli, Nagpur. Clinical and risk factors data was collected by clinical evaluation and reviewing hospital record. Angiographic data was collected by analyzing angiograms done after patients were discharged.

RESULTS: A total of 40 patients were included in the study out of which 30 (75%) were male. Their mean age \pm SD was 53 ± 10.8 years. 25% patients suffered from hypertension, 37.5% had diabetes mellitus, 50% had dyslipidemia, 35% were smokers and 32.5% had history for premature coronary artery disease.

On angiographic analysis 35 patients (87.5%) had single vessel disease (SVD), 2 patients (5%) had double vessel disease (DVD), and 3 patients (7.5%) had normal coronary arteries. Out of 37 patients the involvement of left anterior descending (LAD) was seen in all patients (100%) and 2 patients had circumflex in addition to LAD.

CONCLUSION: Wellens syndrome represents critical LAD disease; accordingly, its natural progression leads to anterior wall MI. This progression is so likely that medical management alone is not enough to stop the natural process. Evolution to an anterior wall MI is rapid & there is the potential for substantial morbidity or mortality. Thus, it is of utmost importance to recognize this pattern early.

KEYWORDS

Risk Factors; Angiographic Characteristics

INTRODUCTION

Coronary artery disease (CAD) is leading cause of death and account for approximately 12 million deaths annually worldwide [1, 2]. In 2004, CAD resulted in 6, 95,000 hospital admissions and \$31 billion hospital charges in United States [3, 4, 5]. It is also the major contributor to the burden of premature mortality and morbidity and accounted for 85 million disability adjusted (DALYs) life years in 1990 [2]. By the year 2020, coronary heart disease and stroke will hold first and fourth positions respectively, in the World Health Organization's list of leading causes of disability [3].

The characteristic ECG pattern of Wellens syndrome is relatively common in patients who have symptoms consistent with unstable angina. Of patients admitted with unstable angina, this ECG pattern is present in 14-18% [6, 7].

Wellens syndrome represents critical LAD disease; accordingly, its natural progression leads to anterior wall MI. This progression is so likely that medical management alone is not enough to stop the natural process. Evolution to an anterior wall MI is rapid, with a mean time of 8.5 days from the onset of Wellens syndrome to infarction [6].

If anterior wall MI occurs, there is the potential for substantial morbidity or mortality. Thus, it is of utmost importance to recognize this pattern early.

Very few studies have addressed this subject. The aim of this paper is to define the clinical profile of patients with Wellens syndrome in terms of risk factors, clinical presentation and angiographic characteristics in terms of vessel involvement.

METHODS AND MATERIALS

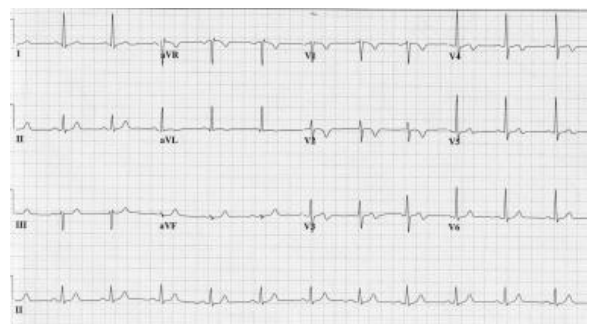
This descriptive study was carried out at the Department of Medicine, Green City Hospital, Dhantoli, Nagpur, India. Clin-

ical and risk factors data was collected by clinical evaluation and reviewing hospital record from January 2011 to December 2011 for a total period of 12 months. Informed consent was obtained from every patient included in the study.

Study populations consisted of patients with Wellens syndrome, age 30 years and above, both genders who were undergoing coronary angiography for diagnostic or revascularization purposes.

Wellens Syndrome criteria include the following:

- Characteristic T-wave changes
- History of anginal chest pain
- Normal or minimally elevated cardiac enzyme levels
- ECG without Q waves, without significant ST-segment elevation, and with normal precordial R-wave progression
- The characteristic ECG changes of this syndrome occur in the T-wave. The ST segment will be straight or concave and will pass into a deep negative T wave at an angle of 60°-90°. The T wave is symmetric. In Wellens syndrome, these changes generally occur in leads V₁ -V₄ but occasionally may also involve V₅ and V₆



Patients less than 30 years of age, those with a history of revascularization procedures (PCI or CABG), with renal failure or with contraindications for coronary angiography were excluded from study.

Baseline demographics, clinical and risk factors data was collected from hospital record and by interviewing patients. Only conventional risk factors including diabetes mellitus, hypertension, dyslipidemia, smoking and family history for premature CAD as defined in operational definitions were assessed in this study. Elective coronary angiography was performed through standard femoral or radial artery approach. Angiographic data were collected by analyzing the angiograms by cardiologist. CAD was defined as >1 epicardial coronary segment with stenosis > 25% and was diagnosed visually. Patients were grouped as having single vessel disease (SVD), double vessel disease (DVD) and triple vessel disease (TVD) according to the number of vessels involvement. Patients were also grouped according to the type of artery involved.

Operational Definitions:

Diabetes mellitus (DM): It was defined as chronic use of anti-hyperglycemic drugs or previously documented diagnosis from medical record or established during hospital stay by repeated fasting blood glucose estimation to be ≥126 mg/dl.

Hypertension: Defined as chronic use of antihypertensive drugs or a previously documented blood pressure 140/90 mmHg for non-diabetics and 130/80 for diabetics from medical record. Positive family history for CAD was defined as ischemic heart disease in the father or a brother diagnosed before age 55 years and in the mother or a sister diagnosed before age 65 years.

Smoking: Any present or previous use of cigarettes was considered smoking.

Dyslipidemia: Fasting LDL level ≥130mg/dl was considered as dyslipidemia.

Coronary artery territories and segments: The left main coronary artery was considered a segment and a territory of its own. Proximal segments comprised the proximal parts of the left anterior descending, the left circumflex, and the right coronary arteries. Mid segments consisted of the mid parts of the 3 main coronary arteries, and of the proximal 1 to 2 cm of major diagonal and obtuse marginal branches. Segments distal to mid segments were considered distal.

Thrombus: A thrombus was scored if an intraluminal filling defect, largely separated from the adjacent vessel wall, was clearly definable.

RESULTS

A total of 40 patients were included in the study with 30 (75%) males. Mean age±SD was 53±10.8 years. Frequencies of risk factors for CAD were; 25% patients suffered from hypertension, 37.5% had diabetes mellitus, 50% had dyslipidemia, 35% were smokers and 32.5% had history for premature coronary artery disease.

These figures are summarized in table 1.

Clinical characteristics		Frequency (n=40)
Age (range)±SD		53±10.8(30-87)
Gender	Male	30 (75%)
	female	10 (25%)
Risk factors	HTN	25%(10)
	DM	37.5%(15)
	DYSLIPIDEMIA	50%(20)
	SMOKING	35%(14)
	POSITIVE FAMILY HISTORY	32.5%(13)
Clinical presentation	Chest pain	40(100%)
	Sweating	38 (95%)
	Diaphoresis	30 (75%)
	Hypotension	8(20%)

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On angiographic analysis 35 patients (87.5%) had single vessel disease (SVD), 2 patients (5%) had double vessel disease (DVD), and 3 patients (7.5%) had normal coronary arteries. Out of 37 patients the involvement of left anterior descending (LAD) was seen in all patients (100%) and 2 patients had circumflex in addition to LAD. 25 patients (62.5%) had severe stenosis more than 70% lumen. This may be due to case selection as only frankly symptomatic and none invasively evaluated patients underwent coronary angiography. **Table 2** summarizes pattern of coronary artery disease on angiography. **Table 3** summarizes the severity of lesion.

TABLE 2

Angiographic findings		Frequency N=40
Significant CAD		37(92.5%)
Number of vessel diseased	SVD	35(87.5%)
	DVD	2(5%)
	TVD	0
		0
LEFT MAIN		
LAD		
LCX		
RCA		
NORMAL CORONARIES		
37		
2		
0		
3		

(SVD- Single vessel disease, DVD- double vessel disease, TVD-triple vessel disease, LM -left Main)(LAD- Left Anterior Descending, LCX-circumflex ,RCA-Right Coronary artery)

TABLE 3

Angiographic findings		Frequency N=40
MILD	<50%	2
MODERATE	50-69%	10
SEVERE	>70%	25

DISCUSSION

Developing countries have a greater share to the global burden of cardiovascular disease than developed countries. The disease is very common in westernized population affecting majority of adults over the age of 60 years. It is also rising in developing countries. The mean age±SD of our study population was 53±10.8 years as compared 62±5 in COURAGE trial conducted in USA⁸. Gender differences in CAD risk are also important Middle aged men have a 2-5 times higher risk than women. But risk ratio differs between populations^{8,9} There was a clear male preponderance (74%) in our study, which is in agreement with previous studies, suggesting that CAD is predominantly a disease of men^{10,11} Female represented only 25% of our patients. This is a much higher frequency compared with data from other study (5%)¹²

Similar to the published reports from other population that smoking is one of the commonest risk factor encountered in patients with acute myocardial infarction¹³⁻¹⁵. Smoking was also the risk factor in 35% of our patient. The male preponderance and smoking being the major risk factors has been well documented in many studies in the subcontinent¹⁶⁻¹⁸ However, in contrast to this study, smoking is not a major risk factor in the COURAGE trial (29%)⁸. Diabetes mellitus, present in 37.5% of our study population, is also a major risk factor for CAD and well known to have an adverse influence on the prognosis. Hypertension and dyslipidemia are also major risk factors for CAD. They were reported to be 35% and 60% respectively in patients with CAD. In our patients, they were 25% and 50% respectively¹⁹

Majority of the patient suffered from single vessel disease (SVD) (87.5%). In few other studies angiography has demon-

strated that 100% of patients with Wellens syndrome will have 50% or greater stenosis of the proximal LAD. More specifically, 83% will have the lesion proximal to the second septal perforator.^{6,7,20} However there is paucity of data regarding severity of lesions in Wellens syndrome

CONCLUSION

Wellens syndrome represents critical LAD disease; accordingly, its natural progression leads to anterior wall MI. This progression is so likely that medical management alone is not enough to stop the natural process. Evolution to an anterior wall MI is rapid & there is the potential for substantial morbidity or mortality. Thus, it is of utmost importance to recognize this pattern early.

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