



Case Report

A Risk Factor Which Can Induced Premature CAD in Women With Positive Family History : A Case Report

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ABSTRACT

Background: Premature Coronary Artery Disease (CAD) was defined as the incidence of CAD in males younger than 45 years of age and in women younger than 55 years of age. Many factors can cause a woman under the age of 55 to develop a CAD. One of the major roles is the patient's family history associated with the occurrence of CAD which is then associated with one or more other CAD-related risk factors such as hypertension, history of Cerebrovascular Accident (CVA), obesity or dyslipidemia.

Objective: This case report was made to elaborate on the importance of family history of PCAD on CAD diagnosis.
Case Presentation: A 47-year-old woman who has not yet experienced menopause comes with complaints of Dyspneu on Effort (DOE). She had multiple history of CVA. She is the 2nd child of 3 siblings. Her father has died due to liver problem. Her mother had a CVA at the age of 62 with history of hypertension. Her uncle from different grandmothers, also had a history of sudden death. She was diagnosed with a coronary artery disease and percutaneous coronary intervention was performed.

Conclusion: The mortality rate of women with CAD is higher than that of men, confirming that CAD in women who appear at the age of less than 55 years should receive more attention, and the task of health workers here is to strengthen history taking related to family history in women with traditional risk factors who have the possibility of developing CAD in the future.

1. Introduction

Coronary Artery Disease is a disease that not only affects men and women of old age, but can occur in men younger than 45 years of age and in women younger than 55 years of age which is then known as premature coronary artery disease.

Several traditional risk factors such as hypertension, smoking, obesity, dyslipidemia are known to cause CAD in both men and women. However, the concept that younger women have a lower risk of developing CAD is currently not quite right because of the emergence of CAD in women younger than 55 years as a premature CAD. Here we will discuss about what factors can influence the occurrence of CAD in women aged less than 55 years.

2. Case Illustration

A 47-year-old woman (BMI 30.4) who has not yet experienced menopause comes with complaints of Dyspneu on Effort (DOE). She had hypertension since 2006, but not routinely controlled. She also had dylipidemia since 2020, her trygliceride recorded at that time was

310 mg/dl. During her last hospitalization, her lipid was high with triglyceride 283 mg/dl, with low HDL 36 mg/dl and slightly increase of LDL 106 mg/dl.

At January 2019, She had her first Cerebrovascular Accidents (CVA) Thrombosis prove by CT (Computed Tomography) Scan with a tingling on the right side of the face. her systolic blood pressure at the time of the attack was known to be 160. At that time, she received treatment at Military Hospital at Malang.

She had a second CVA that affected her left hand and foot at March 2020. She begins to notice swelling in the legs that arises when sitting for a long time and disappeared when carried on walking. Unfortunately there was no data supporting her 2nd CVA attack like CT or Carotid Artery Doppler Ultrasound.

She started DOE when walking < 100 m which disappeared with rest at September 2021. She seek medical treatment and treated by cardiologist. Echocardiography was performed, found a decrease in LV function and sign of CAD.

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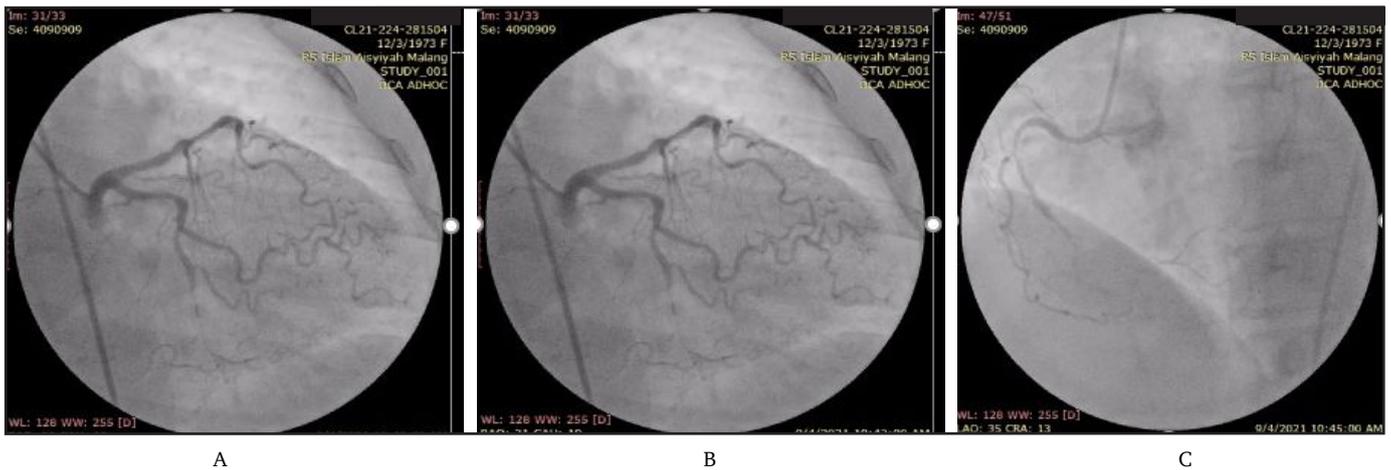


Figure 1. (A) Diffuse stenosis 80-85 % at prox-distal; (B) Diffuse stenosis 80-90 %, CTO at distal; (C) Diffuse stenosis 85 % at proximal, CTO at distal

Her first Diagnostic Coroangiography (DCA) shows diffuse stenosis 80-85 % at proximal until distal LAD, diffuse stenosis 80-90 % and CTO at distal LCx, and Diffuse stenosis 85 % at proximal RCA and CTO at distal RCA. She was diagnosed as CAD Three Vessel Disease. She underwent her first PCI with 2 Drug Eluting Stent (DES) in the proximal-mid Left Anterior Descending (LAD) and in the next PCI with 2 DES at distal Left Circumflex (LCx).

She is the 2nd child of 3 siblings. Her first sister is still alive and now is 50 years old without any medical problems. Her last sister is alive and now is 46 years old with epilepsy. Her father has died due to liver problem. Her mother (1st degree relatives) still alive and had a CVA with history of hypertension. Her uncles (2nd degree relatives) from different grandmothers, also had a history of sudden death.

3. Discussion

CAD is the most common cause of death in both men and women. More women die than men from CAD. More women die of CAD than cancer (including breast cancer), lower respiratory tract disease, Alzheimer's disease and accidents. From 1998 to 2009 the mortality rate associated with CAD decreased by 30.6% in the United States, but the incidence was increasing in young women younger than 55 years.¹

CAD in women has more dangerous consequences than in men. In individuals with premature MI under 50 years of age, women have a mortality rate that is twice as high as that of men. In individuals older than 65 years, more women die in the first year after an MI. In individuals aged 45 to 64 years, women are also more likely to develop heart failure in the first 5 years after MI.¹

Family history of premature CAD is an important risk factor for CAD at a young age. The emphasis is on the part of certain genes in the etiology of CAD in young people. Several studies suggest a family history of premature CAD as a strong predictor of a future coronary event. One study showed that approximately 64% of CAD at a young age had a positive family history. The prevalence of conventional risk factors such as dyslipidemia (67%), hypertension (67%), diabetes (33%), smoking (42%) and obesity (53%) was more prevalent in women with a family history of CAD.²

For more than half a century MI has often been found in a family cluster where it is associated with inherited factors that play a role in the development of the disease. The emerging clusters have

different patterns related to the genetic specificity of each affected family.³

The prevalence of conventional risk factors such as diabetes, obesity, hypertension, dyslipidemia and smoking is approximately 85-90% in patients with premature CAD. In CAD patients at a young age usually have several risk factors that contribute to the emergence of the disease. However, dyslipidemia is regarded as one of the most important risk factors for PCAD. There is a slight difference in the characteristic of lipid abnormalities in older patients compared to younger patients. One study demonstrated that there was a significant increase in total cholesterol and LDL levels in patients with CAD over 55 years of age compared to patients younger than 55 years.²

Studies indicated that as compared to men, High TG levels are a strong predictor of CAD in women. CAD risk increased by up to 75% in women compared to 30% in men following increase in a TG level of 90 mg/dl. High HDL (>57 mg/dl) and Low TG (<97 mg/dl) were associated with a very low risk of developing CAD.⁴

Increased cardiovascular risk also associated with Increased blood pressure. However, Blood pressure is a dynamic parameter that can change over time, rather than a rigid one. It is not only the severity of hypertension that affects the outcome but also the duration of the hypertension itself. In this case, In middle-aged and elderly people, the accumulation of blood pressure, which is the combination of severity and duration of high blood pressure, is a strong predictor of CV events, but for young individuals the evidence is limited.⁵

Overweight and obesity are also significantly more common in heart disease in young people than in old age. Obesity increases the risk of acute myocardial infarction by 2-3 times in individuals less than 45 years of age.⁶

Endothelial dysfunction is associated with cardiovascular risk and represents an early stage of atherosclerosis. In addition to CAD, impaired endothelial function is also associated with cerebrovascular events compared to individuals with normal endothelial function. In this case CVA and CAD have a relationship.⁷

In this patient with high familial risk for coronary artery disease (personal history of early onset CAD, one 1st degree relatives and at least one 2nd degree relatives with another related condition such as stroke, diabetes or sudden death)⁸, was found with several other risk factors that strengthened the occurrence of premature CAD in patients such as hypertension, obesity, dyslipidemia and CVA.

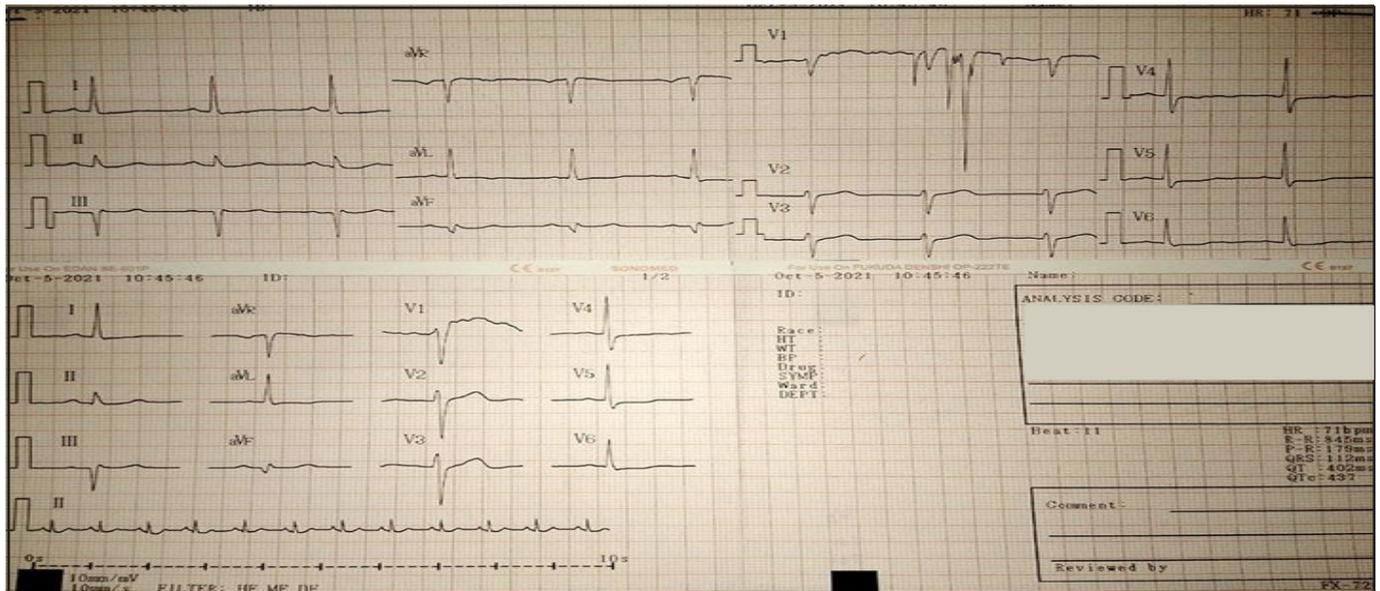


Figure 2. ECG performed at our hospital showed Sinus Rhythm, HR 71 bpm, FA LAD, HA CWR, Poor R Wave Progression, QS lead III and aVF

4. Conclusion

Many factors cause premature CAD in female patients younger than 55 years. A positive family history increases the prevalence of premature CAD in women who have traditional risk factors such as obesity, dyslipidemia, hypertension, or CVA. The mortality rate of women with CAD is higher than that of men, confirming that CAD in women who appear at the age of less than 55 years should receive more attention, and the task of health workers here is to strengthen history taking related to family history in women with traditional risk factors who have the possibility of developing CAD in the future.

5. Declarations

5.1. *Ethics Approval and Consent to participate*
Not applicable.

5.2. *Consent for publication*
Not applicable.

5.3. *Availability of data and materials*
Data used in our study were presented in the main text.

5.4. *Competing interests*
Not applicable.

5.5. *Funding source*
Not applicable.

5.6. *Authors contributions*
Idea/concept: AW. Design: AW. Control/supervision: MSR, ER, CT. Data collection/processing: AW. Analysis/interpretation: AW, MSR, ER. Literature review: MSR, ER, CT. Writing the article: AW. Critical review: MSR, ER, CT. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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