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FACTORS RELATED TO MYOCARDIAL INFARCTION AMONG YOUNG MALES IN CARDIOLOGY UNIT OF TEACHING HOSPITAL, KANDY, SRI LANKA

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Abstract— **Myocardial infarction (MI) is a major cause of death and disability worldwide. The purpose of this study is to examine the factors related to MI among young males (18-40 years) in Cardiology unit at Teaching hospital Kandy, Sri Lanka. The quantitative non-experimental approach and descriptive correlational design was carried out to explore the factors related to MI among patients attending to cardiology clinic and wards in Teaching hospital Kandy. A researcher-administered questionnaire was distributed among 177 patients. Ethical approval was obtained from the same hospital. Data was analyzed by descriptive statistics using SPSS 22 version. Majority of the participants (97.6%) were between aged 30 to 40. More than 90% of subject presented with dyslipidemia and high dietary intake of meat as physical risk factors. Under social factors, daily alcohol consumption and smoking reported in about 82% and 51% respectively while also 28% of participants engage in outdoor leisure time activities. Considerably less than 20% of respondents presented with anxiety and depression as the psychologically affected risk factors. Most of the risk factors which were found are modifiable factors like alcoholism, smoking and high dietary intake of meat. Therefore, it is recommended to have more awareness programs emphasizing the importance of adhering to life style modifications by means of reducing the risk and to control the further occurrence of MI of affected people.**

Keywords— **Myocardial infarction, alcoholism, smoking, life style modifications**

I. INTRODUCTION

Myocardial infarction (MI) is usually known as the "heart attack" among the people. According to WHO (2017) reports, it is a major cause of death and disability worldwide. The worldwide incidence of Myocardial infarction has been increasing over the years and it has become the leading cause of death universally. Myocardial infarctions and strokes are responsible for 32.4 million deaths worldwide every year as mentioned by WHO (2018).

Mainly MI occurs in patients older than 45 years old. At present, the incidents reported with young men and women suffering from MI is considerably high according to Taber (2009). Further, the prevalence of MI among young male (18-45 years) is very common than young female. Women typically suffer from heart disease ten years later than men as a result of the decrease in cardiac protective estrogen following the menopause (Nettina, 2009). However, when this disease condition occurs at young age usually it carries significant morbidity, psychological imbalances, and financial constraints for the diseased person and the family. The natural protection offered by the young age has been slowly taken away by the increased prevalence of risk factors for CHD in adolescents such as increase the rate of smoking, alcoholism and adherence to sedentary life styles.

MI can be defined as "the myocardial cell necrosis due to significant and sustained ischemia and also, usually, but not always, an acute manifestation of atherosclerosis-related coronary heart disease" (WHO, 2013). Several risk factors have been identified for MI among young males as dyslipidemia, smoking, and hypertension (Bhardwaj et al., 2014). MI among young males can be prevented by additional education on significant risk factors. However, it can be recognized by clinical features including Electro Cardio Graph and biochemical elevation. Common signs and symptoms are chest tightness, pain in the chest, arm and it spread to neck, jaw or back (Nettina, 2010). Fortunately, the prognosis is at a significant level when treated properly as they are young patients. On the other hand, poor control of risk factors carries a significant increasement of morbidity and mortality rates.

According to the profile of Sri Lankan, Bandara et al. (2005) reported that MI among the young males increase with smoking, hypercholesteremia, diabetic mellitus and hypertension. The literature review revealed there were less Sri-Lankan Studies regarding the factors related to Myocardial Infarction among young males. But numerous studies have been conducted globally. Therefore, Sri Lankan study on this

topic is a necessity as MI among the young Sri Lankans is also increasing day by day as mentioned by Ministry of Health and Nutrition (2017). Furthermore, identification of risk factors will help to reduce MI among young males and indirectly it helps to reduce the cost of health utilization among them and it has a positive impact on the economy of the country.

The main purpose of this research is to study risk factors related to MI in young males in the Cardiology Unit in the Teaching Hospital, Kandy. Specific objectives are to identify the Physical factors, social factors and psychological factors related to MI among males (18-40 years) at cardiology unit in Teaching Hospital, Kandy. By doing this study we hope to emphasize the importance of secondary preventive measures in all young patients admitted with MI for preventing further attacks. Also, prevent MI among young males by disseminating facts through health education sessions.

II. METHODOLOGY

A quantitative non-experimental descriptive study was conducted in the cardiology unit in Teaching Hospital Kandy in Sri Lanka during 15th of January 2018 to 15th April 2018. A self-administered questionnaire was distributed among 177 patients, diagnosed with Myocardial Infarction, who were admitted in the cardiology unit, Teaching Hospital, Kandy on different domains such as physiological, social and psychological risk factors for MI among young males. The sampling was done by using convenient sampling method. Ethical approval was obtained from the Ethics Review Committee of Teaching hospital Kandy, Sri Lanka. The permission was obtained from the Director of the Teaching Hospital, Kandy. Data were analyzed by descriptive statistics using SPSS 22 version and summarized by frequencies and percentages.

III. RESULTS

Based on the collected data, expected to describe the demographic characteristics of the study participants, the physical factors, social factors and psychological factors related to MI among young males. Even though the sample size was 177, the respondent rate was 170.The proposed scheme is tested using ordinarily image processing. From the simulation of the experiment results, we can draw to the conclusion that this method is robust to many kinds of watermark images.

Table -1 Demographic Characteristics of the study participants

Demographic characteristics of the study sample	**Category**	**Frequency**	**Percentage (%)**
Age (years)	18-30	0	0
	30-40	166	97.6
	40-45	4	2.4
Body Mass Index (kg/m²)	<18.5	6	3.52
	18.5 - 24.9	47	27.6
	25 - 29.9	113	66.4
	>30	4	2.3
Ethnicity	Sinhala	136	80
	Tamil	10	5.9
	Muslim	24	14.1
Religion	Buddhist	132	77.6
	Hindu	10	5.9
	Islam	22	12.9

As interpreted in Table 1, 166(97.6%) of study participants were aged between 30 – 40 while only 4 belonged to 40 – 45 age group. About two thirds of the respondents belonged to the overweight category (BMI = 25 - 29.9 Kg/m2) while around 27% had normal BMI and only around 2% were obese. In this study sample, 136 participants (80%) were Sinhalese, 10 (5.9%) were Tamils and 24 (14.1%) were Muslims. Among them the majority were Buddhists and around 6% and 13% were Hindus and Islamic respectively.

According to the research findings following data were met under physical risk factors of young males related to MI. Table 2 showed the family history of Non-Communicable Diseases (NCDs) and Figure 1 showed the pattern of the family history of NCDs.

Physical risk factors of young males related to MI

Table -2 Family history of risk factors

Risk factor	**Amount**	**Percentage (%)**
Diabetes Mellitus (DM)	76	45
Hypertension (HTN)	66	39
Heart Diseases	68	40

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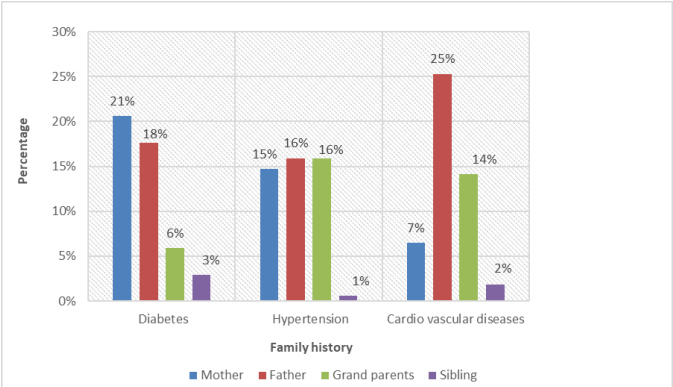
Fig. 1. Pattern of family history of risk factors



As per the present study findings, 40% of young males had family history of one or more NCDs. In here about 45% had the family history of DM. Among them, 21% of respondents had family history of DM from maternal paternity while 18% from paternal paternity. Further 39% of respondents had the family history of HTN. Among them, 15% were reported with HTN from maternal paternity, 16% from their fraternal paternity while significantly another 16% from their grandparents. Furthermore, 40% of participants were reported with the family history of heart diseases. Among them, the majority were from paternal paternity while 7% were from their maternal paternity.

Physical factor	Category	Amount	Percentage (%)
History of risk factors	Diabetes mellitus (DM)	26	15
	Hyperlipidaemia	156	92
	Hypertension (HT)	25	15
Treatment pattern	On regular treatment	141	83
	On irregular treatment	21	12.4
	Stop treatment	1	1
	Never got treatment	7	4.1

Table -3 The history of prevalence of risk factors of MI and pattern

Table 3 interpreted the history of the prevalence of risk factors of MI among young males in the study sample and pattern of treatment. Among 170 participants, 26 (15%) had diabetes mellitus, 156 (92%) of young males reported with hyperlipidemia and 25 (18%) had hypertension beforehand diagnosed with MI. Also, 6 (4%) of the study participants had none of the risk factors related to MI. Further, 11 respondents had both DM and Hyperlipidemia, 15 respondents had both Hyperlipidemia and HT and 13 respondents had both HT and DM. Furthermore, 9 study participants of the study had all three risk factors. When considering the treatment patterns for the risk factors they were presented with; 141(83%) of them were on regular treatments while only 21(12%) were on irregular treatments. Further, 7(4%) of them stated that they had not taken treatment for any previously diagnosed risk factor.

Social factors related to MI among young males

Social factor	Category	Amount	Percentage (%)
Smoking pattern	Non-smokers	108	63.5
	Intermittent smoking	35	20.9
	Daily smoking	27	15.9
	Exposure to passive smoking (non-smokers)	24	14.1
Alcoholism	Non-drinkers	11	6.4
	Moderate drinking	49	28.8
	Heavy drinking	110	52.9
Dietary Habits	Eat only home prepared food	65	31.3
	Usually eat fast food & food from restaurants	63	30
	Daily meat consumers	129	75.9
Physical activity	Light workers	83	48.8
	Heavy workers	87	51
	Engage in outdoor leisure time activities	48	28.2

Table -4 Social Factors Associated with MI

As presented in Table 3, the study has tested the pattern of smoking, alcoholism, diet and physical activities as social risk factors related to MI among young males. Regarding the smoking pattern, more than half of the study subjects were non-smokers and about 14% were not exposed to passive smoking also. Moreover, 16% were heavy smokers and 31% were intermittent smokers. Among study subjects who belonged to the "non-smokers" category, 24 were exposed to passive smoking daily.

About two-thirds of the respondents were heavy alcoholics while 49 were moderate drinkers and only 11 were non-drinkers. When considering dietary habits of the study participants, about 31% of young males stated that they consume home-made food only while another 30% reported that they usually have food from restaurants and also consume fast food. Among them, there were 129 (75.9%) daily meat consumers. Half of the study subjects were lightworkers and

another half were reported as heavy workers. Among them, about 28% were engaged in outdoor activities.

Psychological risk factors for MI among young males

Table -5 Psychological Factors Associated with MI

Psychological factors	Amount	Percentage (%)
Depression	12	7
Anxiety	8	4.7
Job related stress	31	18.2
Family life related stress	26	15.3

As concluded in Table 5, 12 participants were diagnosed with depression while 8 were diagnosed with anxiety. Also 31 and 26 participants had stress which influenced by job and family problems respectively.

IV. DISCUSSION

The majority (97.6%) of study participants were aged between 30 – 40. In contrast to the present study an Indian study was found that a smaller number of young adult males (78.57%) have belonged to the 30 – 40 age categories. More than two-thirds of the respondents belonged to the overweight category (BMI >25Kg/m2) while around 27.6% had normal BMI value (BMI= 18.5-24.5Kg/m2). This result was incompatible with a study done in Southern Sri Lanka by Jayawardhana et al. (2017), as they found only 26.8% of the respondents have belonged to overweight category while about half of them were had normal BMI values.

Physical risk factors for MI among young males

Prevalence of family history among young males was accounted as 40%. Among them altogether 39% were had the family history of HTN. This result was compatible with Akram et al (2015), as they found that the prevalence of the family history of coronary artery disease (CAD) is 36%. However, Bhardwaj, Kandoria and Sharma (2014) noticed that family history of CAD was present in lesser amounts as 17.7%.

Past history of having non-communicable diseases is a significant predictive factor of having MI in later life. Majority of the respondents (92%) of the current study reported with hyperlipidemia while 15% had diabetes mellitus and 18% had hypertension beforehand diagnosed with MI. According to Katulanda et al. (2018) (A Sri Lankan study) revealed that 77.4% of Sri Lankan adults have some form of dyslipidemia. However, Bandara et al. (2017) identified in his study 39% of young male MI patients had increased LDL, as a percentage it was comparatively lower than what was found in the current study. Present study result was contrasted with a study done in India as 44.4% of respondents were reported with hypertension while only 8% were presented with diabetic mellitus beforehand diagnosed with MI (Bhardwaj, Kandoria and Sharma, 2014). Kiani, Hesabi and Arbabisarjou (2015) stated that in the same amount (26%) participants had hypertension and diabetes history while about 15.5% were had cholesterol history. Finding regarding the prevalence of hyperlipidemia in the current study is compatible with a study done by Adam (2017) in Pakistan. But the other two risk factors were reported in high percentages as hypertension in 70.4% and diabetes in 51.2%.

The percentages of presented with DM and HTN of a study conducted among the young Middle East and South Asian men by Jamil et al. (2013) were similar to current study results. But in contrast to the present study Zamani et al. (2017) revealed that 56% had DM and 56% had HTN.

Social risk factors for MI among young males

There are enough research findings to suggest that smoking may be the most prevalent risk factor among young MI patients. In the current study all together there were 62 smokers (37%) while 24 nonsmokers were also exposure to passive smoking. A Sri Lankan study done by Kumarasiri et al. (2013) reported that smoking status has a significant association with MI. Akram et al (2015) and Bhardwaj, Kandoria and Sharma (2014) findings were little bit higher than current study findings. Those two studies were concluded that more than half of the participants were smokers as 56% and 58.8% respectively. Further, another two Indian studies conducted by Sinha (2017) and Bhandari et al. (2017) respectively were reported that more than two third of the participants did smoking. Also, contrast to the present study, Kiani, Hesabi and Arbabisarjou (2015) stated that only 13% of the respondents did smoking. Further, De Silva et al (2009) reported that the prevalence of smoking was 29.9% in urban areas and 24.4% in rural areas in Sri Lanka.

About half of the patients were heavy alcoholics and nearly 28% were moderate alcoholics in the current study. In comparison, another Sri Lankan study done by De Silva (2009) reported that the prevalence of alcohol use among males was 32.9%. Similar to current study findings, Mostofsky et al. (2015) found that there were 55% reported daily alcohol consumption in the US before the onset of MI compared with no alcohol consumption. Similar to present study Biyik et al. (2007) and Laatikainen et al. (2012) reported that heavy alcohol consumption promotes MI risk. In contrast, Darry et al. (2014) and Janszky et al. (2008) have reported that moderate alcohol consumption is associated with a decreased MI.

Significantly there were 75% of daily meat consumers and also 30% of the respondents were having fast foods from restaurants daily. According to a study done by Hunnicutt et al. (2014) at Indiana University reported with more than half of the participants were high meat consumers and it was a strong association between heme iron intake and MI.

In the current study half of the study participants were heavy workers while another half were light workers. Also, 28%

were engaged in outdoor leisure time activities. Akram et al. (2015) concluded that a higher prevalence of other factors of hypertension like obesity, sedentary life habits and feeding habits in the present study group could be a contributing factor for the high prevalence.

Psychological risk factors for MI among young males

In this study, there was a minimal association of psychological risk factors for MI among young males. Family life-related stress and work-related stress was around 15% among the subjects. Other psychological risk factors like anxiety and depression also presented less than 10%. But in contrast to our findings most local and international study findings were revealed that psychological risk factors were closely associated with increased MI risk among young males (Kumarasiri et al., 2013, Xu T et al., 2011). In a Japanese study conducted by Yousefy and Nekouei (2013) identified depression, anxiety, and stress caused by life events as common psychological risk factors. It would be better to conduct further research on psychological risk factors as we were unable to identify a significant association of psychological risk factor for MI among young males. Studied conducted in Australia by Afzal et al. (2015) and Pakistan by Bunker et al. (2003) found that anxiety is an emerging risk factor for developing MI and also concluded, increased risk contributed by the psychosocial factors is similar order to the more conventional MI risk factors such as smoking, dyslipidemia, and hypertension.

V. CONCLUSION

The maximum number of patients was in 30-40 years of age. The youngest patient was 31 years old male. More than half of the young males were overweighed. Hyperlipidemia was the most commonly reported risk factor in the present study (92%). Also, 18% had hypertension and 15% had diabetes mellitus. Considerably about half of the adult males were non-smokers. But 14% of them were exposed to passive smoking. Moreover, 15% of the respondents did daily smoking. Further, half of the participants were heavy alcoholics as well as 29% of the respondents were moderate alcoholics. However, a significant percentage of substance abuse like heavy alcoholism and smoking were also able to identify as sociological risk factors. Two third of them were daily meat consumers. It was clear that there would be an association between these two factors as meat contains a high amount of fat. High meat consumers usually presented with dyslipidemia. There was a minimal association of psychological risk factors for MI among young males. Family life-related stress and work-related stress was around 15% among the subjects. Other psychological risk factors like anxiety and depression also presented less than 10%.

In the current study the most common modifiable risk factor was hyperlipidemia and other common conventional modifiable risk factors in decreasing order of frequency were alcoholism, sedentary lifestyle, dietary patterns, smoking, hypertension, and diabetes mellitus.

Based on the findings we recommend conducting health community screening programs to identify the prevalence of risk factors of MI and to identify those who are vulnerable to develop risk factors. Further, recommended to conduct education programs for high-risk groups and programs aimed at preventing NCDs.

Shortage of similar studies carried in Sri Lanka and in other countries of the world especially on psychological risk factors makes the comparison and discussion difficult. The generalizability of the study finding was limited as the majority of the study participants were adult males (less than 40 years old).

VI. AKNOWLEDGEMENT

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