Original Article

Assessment of Risk Factors for Cardiovascular Diseases among Adults and Geriatrics, Bangalore, India

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Abstract

Objective: The study was designed to assess the various risk factors associated with cardiovascular diseases among the adult and geriatric patients, to assess the most common type of cardiovascular diseases in these patients, to identify the number of patients who are at risk of developing cardiovascular disease in next 10 years by using JBS3 scale and to provide patient information leaflets to guide the patients in managing the risk factors and counsel the patients. **Methodology:** A hospital based observational study was carried out at St. Philomena′s hospital located in Bangalore. Ethical committee clearance was obtained from the hospital before initiating the study. All In-patient and Outpatient of both genders who are presented with any one of the risk factors of cardiovascular disease, with lipid profile data and with age group 18-65 years (Adults) and above 65 years (Geriatrics). All the data including patient's past medical history, medication history, social history, lab investigations, modifiable risk factors, and non-modifiable risk factors was collected. The medications prescribed were noted, patient counselling and patient information leaflets to guide the patients in managing the risk factors was given. **Result:** The results of the study showed that the risk factors like stress, diet and family history are more common in adults whereas, risk factors like obesity, physical inactivity, social habits, high Department of Pharmacy Practice, AACP, Bengaluru Phar.D. cholesterol levels, co-morbidities like hypertension, diabetes mellitus and hypothyroidism are more common in geriatrics. However, they are insignificant based on statistical analysis. Out of 161 patients it was found that 40 study subjects had already developed CVD. It was observed that IHD and CCF were the most common cardiovascular disease in the study population in which geriatrics were mostly affected. Among 40 CVD patients the risk factors like high cholesterol, family history, diet, stress is more in adults where as co-morbidities like hypertension, diabetes mellitus and hypothyroidism are higher in geriatrics and risk factors like obesity, social habits, physical inactivity are common in both adults and geriatrics although they were found to be statistically insignificant. By using JBS3 scale it was found that 61 patients are at risk of developing CVD in next 10 years in which geriatric patients are more in number, which is statistically significant. In these patients risk factors like physical inactivity, high cholesterol level, co-morbidities were more common and higher in geriatrics. **Conclusion:** The risk factors and the risk of developing CVD was more common in geriatrics than adult patients. The results depicted that the risk factors are statistically insignificant whereas the JBS 3 risk assessment was proven to be statistically significant.

Keywords: Risk Factors, Cardiovascular Diseases, risk assessment, JBS3 risk

INTRODUCTION

Cardiovascular diseases (CVD) are a class of diseases that involve the heart or blood vessels. Up to 90% of cardiovascular diseases may be preventable if established risk factors are managed. The purpose of assessment of cardiovascular risk factors is to reduce disability and premature deaths. It is found that the risk factors are not the same for the adults and the geriatrics population. [1]

More than 75% of CVD passing occur in low-and center salary nations. Out of the 17 million unexpected losses (younger than 70) due to non-transmittable ailments in 2015, 82% are in low-and center pay nations, and 37% are brought about by CVDs. Most cardiovascular maladies can be forestalled by tending to social hazard factors, for example, tobacco use, undesirable eating regimen and stoutness, physical inertia and unsafe utilization of liquor utilizing populace wide methodologies Cardiovascular illnesses (CVDs) have now become the main source of mortality in India. A fourth of all mortality is owing to CVD. Ischemic coronary illness and stroke are the overwhelming causes and are liable for >80% of CVD passing. In India, the epidemiological change from prevalently irresistible

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How to cite this article: Oboudi, S., Rani R Hiremath, Sh. Assessment of Risk Factors for Cardiovascular Diseases among Adults and Geriatrics, Bangalore, India. Arch Pharma Pract 2020;11(S1):110-6.

infection conditions to non-transferable sicknesses has happened over a somewhat concise timeframe. [2]

A significant focal point of the JBS3 report is evaluating cardiovascular ailment (CVD) hazard over a lifetime to help illuminate avoidance systems with way of life changes (mediations) and, where important, tranquilize treatment. JBS3 incorporates estimation of the generally utilized 10-year hazard estimation, as recently suggested in JBS2, however now stretches out this to incorporate CVD chance over a lifetime, connected to our JBS3 chance number cruncher. By just utilizing momentary hazard gauges, which are vigorously reliant on age and sexual orientation, more youthful subjects and ladies will in general be ignored regardless of whether they have considerably raised hazard factors that can be changed, (for example, smoking), and are thus at high lifetime chance. Proof shows that early way of life intercessions and, where important, sedate treatment can diminish or back off CVD and in this way the danger of future CVD occasions, for example, respiratory failure or stroke. This change to 'lifetime hazard' speaks to an open door for interest in future cardiovascular wellbeing. [3]

CVD seems, by all accounts, to be identified with long haul and joined introduction to hazard factors, (for example, smoking and having hypertension). There is a chance to change CVD movement in a person by prior intercession on hazard factors. CVD chance over lifetime can be evaluated and considers both hazard from CVD and contending infections, for example, disease. Similarly, as with 10-year chance levels, lifetime hazard gauges speak to the normal figures taken from contemplating enormous gatherings of individuals; so alert ought to be applied in their utilization with singular patients. All things considered, lifetime hazard is a novel method for imparting a danger to people in a clinical setting, for example, a GP medical procedure. [4]

Lifetime hazard estimation ought to be utilized notwithstanding the gauge of 10-year chance. It isn't expected basically as a guide for GPs to settle on medicate commencement yet as an approach to show an individual the lifetime results from their present way of life/hazard factors and the considerable chance to lessen/defer future CVD occasions by early suitable way of life changes and medication medicines. [5]

Untimely mortality as far as long stretches of life lost on account of CVD in India expanded by 59%, from23.2 million (1990) to 37 million (2010). In spite of wide heterogeneity in the commonness of cardiovascular hazard factors across various districts, CVD has developed as the main source of death in all pieces of India, including less fortunate states and provincial regions. [6]

Constant cardiovascular breakdown is a typical condition with a commonness extending from 0.3% to 2% in the populace everywhere, 3–5% in the populace more than 65 years of age and somewhere in the range of 8% and 16% of those matured more than 75 years. Cardiovascular breakdown represents 5% of grown-up clinical admissions to emergency clinic. There is lost cardiovascular save with age, and cardiovascular breakdown may regularly confuse the nearness of different conditions in the old. An expected 17.7 million individuals passed on from CVDs in 2015, speaking to 31% of every single worldwide demise. Of these passing, an expected 7.4 million were because of coronary illness and 6.7 million were because of stroke. [7] Keeping this as background the present study "Assessment of risk factors for Cardiovascular diseases among Adults and Geriatrics" was initiated at the study site.

Materials and Methods

The study was carried out in both In-patient and out-patient departments of St. Philomena′s hospital, Bangalore.

Inclusion criteria:

- All In-patients and out patients of both genders who are presented with any of the risk factors of cardiovascular disease.
- All In-patients and out patients of both genders with lipid profile data.
- All In-patients and out patients of both genders of age groups 18-65years (Adults) and above 65 years (Geriatrics).

Exclusion criteria:

- Patients with cardiovascular diseases secondary to any other underlying condition.
- Pediatric patients and Pregnant women.
- Patients who are not willing to participate in the study.

Study procedure:

The research students carried out ward rounds on a daily basis and collected the data from the patient's case sheets. All the data including patient' s past medical history, medication history, social history, lab investigations, modifiable risk factors, and non-modifiable risk factors were collected. The medications prescribed was noted, patient counselling and patient information leaflets to guide the patients in managing the risk factors was given.

Result and Discusion

A prospective study on "Assessment of risk factors for cardiovascular diseases among adults and geriatrics" was carried out at St. Philomena's hospital after obtaining the institutional ethical committee clearance for a period of 6 months from October 2017 to March 2018. A total number of 161 patients were enrolled in the study and assessed for the risk factors for cardiovascular diseases from both outpatients as well as inpatients who had been advised for a lipid profile at St. Philomena's hospital. Out of 161 patients 77 were male (48%) and 84 were female (52%). Among 161 patients 84

patients (52%) were adults (18-65years) and 77 patients (48%) were geriatrics (more than or equal to 65years).

BMI categorizes the patients as underweight, normal weight, overweight, or obese based on the value obtained after calculation. In this study, overweight and obese patients are considered to be at a risk of developing CVD. The distribution of patients based on the BMI was found to be 100 patients (62.1%) overweight, 23 patients (14.3%) obese. Out of this, overweight were 49 patients (58%) in adults and 51 patients (66%) in geriatrics, obese were 12 patients (15%) in adults and 11 patients (14%)in geriatrics. Overall, overweight and obesity relate to CVD mortality in a strong and graded manner.

The Lipid profile of the patients plays a vital role in CVD. It is very essential to collect patient's lipid profile in assessing their health status. Serum cholesterol, triglycerides, HDL, LDL, VLDL and TC/HDL ratio were determined in all the 161 patients. Out of 161 patients advised for lipid profile, 62 patients (74%) among adults and 52 patients (67%) among geriatrics were categorized as having normal lipid profile whereas, 22 patients (26%) among adults and 25 patients (33%) among geriatrics were categorized as having abnormal lipid profile.

This study indicated that family history of cardiovascular disease as a significant risk factor for developing cardiovascular disease. Among 161 patients, 59 patients (70%) in adults and 44 patients (57%) in geriatrics were found to have a family history of Cardiovascular disease. Physical inactivity is an established risk factor for cardiovascular diseases. More activity is associated with a lower risk of developing cardiovascular disease when compared to less physical activity. The assessment of physical activity was carried out using The RAND 36-Item Health Survey. Out of 84 adults, 49 patients (58%) were physically inactive whereas out of 77 geriatrics, 54 patients (70%) where physically inactive. Table no.1

The role of diet is crucial in the development and prevention of cardiovascular disease (CVD). Diet is a key modifiable risk factor for CVD. In our study, distribution of patients based on diet was found to be very significant. Among 84 adults, 75 patients (89%) followed non-vegetarian diet, and among 77 geriatrics it was found that 61 patients (79%) followed non-vegetarian diet.

Table 1: Distribution of CVD patients

Distribution of CVD patients based on BMI					
Si.No		No.Of Patients		Percentage	
Adults		Geriatrics	Adults	Adults	Geriatrics
1	Yes	4	8	31%	30%
2	No	9	19	69%	70%
	Total	13	27	100%	100%
	P Value =0.941, Not Significant				
	Distribution of CVD patients based on Stress level				
1	Low Stress (0-13)	2	10	8%	15%
2	Moderate Stress(14-26)	3	5	8%	7%
3	High Perceived Stress(27-40)	5	4	30%	15%
4	None	3	8	54%	63%
	Total	13	27	100%	100%
	P Value= 0.286, Not Significant				
	Distribution of CVD patients based on Physical activity				
1	Yes	4	8	31%	30%
2	No	9	19	69%	70%
	Total	13	27	100%	100%
	P Value =0.941, Not Significant				
	Distribution of CVD patients based on Diet				
1	NON-VEG	11	21	85%	78%

2	VEG	2	6	15%	22%
	Total	13	27	100%	100%
	P Value = 0.612,Not Significant				
	Distribution of CVD patients based on Social habits				
1	Only Smoking	3	7	23%	26%
2	Only Alcohol	2	3	15%	11%
3	Both	3	6	23%	22%
4	None	5	11	39%	41%
	Total	13	27	100%	100%
	P Value =0.982, Not Significant				
	Distribution of CVD patients based on Family history				
1	Yes	9	12	69%	44%
2	No	4	15	31%	56%
	Total	13	27	100%	100%
	P Value = 0.141, Not Significant				
	Distribution of CVD patients based on Lipid profile				
1	Normal	8	18	61%	67%
2	Abnormal	5	9	39%	33%
	Total	13	27	100%	100%
	P Value = 0.750, Not Significant				
	Distribution of CVD patients based on Co-morbidities				
1	Only Hypertension	3	8	23%	30%
2	Only Diabetis Miletus	2	5	15%	18%
3	Both	8	14	62%	52%
4	None	0	0	0%	0%
	Total	13	27	100%	100%
	P Value =0.845, Not Significant				
	Distribution of CVD patients based on Thyroid levels				
1	Normal	9	21	69%	78%
2	Abnormal	4	6	31%	22%
	Total	13	27	100%	100%
	P Value =0.558, Not Significant				

Assessment of stress levels in patients determines the risk of developing cardiovascular disease. In our investigation, circulation of patients as indicated by feelings of anxiety were resolved dependent on Saw Pressure Scale. The Apparent Pressure Scale is a great pressure evaluation instrument. it comprises of a survey which poses inquiries about your sentiments and musings during the most recent month. For each situation, you will be approached to demonstrate how frequently you felt or thought a specific way. Singular scores on the PSS can go from 0 to 40 with higher scores demonstrating higher saw pressure. PSS classifies stress in four levels, they are low stress (0-13), moderate stress (14-26), high perceived stress (27-40) and none. In the study conducted, it was found that out of 84 adults, 12 patients (14%) had low stress, 8 patients (10%) had moderate stress, and 28 patients (33%) had high perceived stress. Out of 77 geriatrics, 16 patients (21%) had low stress, 14 patients (18%) had moderate stress, and 18 patients (23%) had high perceived stress.

Social habits are the major risk factors for CVD. Among 84 adult patients, 11 patients (13%) were only smoking, 5 patients (6%) were only on alcohol, 15 patients (18%) were both smoking and on alcohol, 53 patients (63%) had no social habits. Whereas, out of 77 geriatric patients, it was found that 15 patients (19%) were only smoking, 4 patients (5%) were only on alcohol, 14 patients (18%) were both smoking and on alcohol, 44 patients (58%) had no social habits. Comorbidities is the most common predisposing factor for cardiovascular disease. Among 84 adult patients, 22 patients

(26%) had only hypertension,16 patients (19%) had only diabetes mellitus, 40 patients (48%) had both hypertension and diabetes mellitus and 6 patients (7%) had none of the above comorbidities. Out of 77 geriatrics, 14 patients (18%) had only hypertension, 8 patients(10%) had only diabetes mellitus, 53 patients (69%) had both hypertension and diabetes mellitus and 2 patients (3%) had none of the above comorbidities.

Hypothyroidism is a key risk factor for cardiovascular disease such as CCF. It was observed that, among 84 adult patients, 11 patients (13%) had hypothyroidism whereas among 77 geriatric patients, 14 patients (18%) had hypothyroidism. Out of 161 patients assessed, it was found that 40 patients already have CVD.

Among 40 patients there were 13 adults and 27 geriatric patients. In 13 adult patients, 5 patients had ischemic heart disease, 1 patient had cardiovascular arrest, 3 patients had congestive cardiac failure, 1 patient had stroke, 1 patient had angina pectoris, and 2 patients had right heart failure. In27 geriatric patients, 8 patients had ischemic heart disease, 4 patients had cardiovascular arrest, 5 patients had congestive cardiac failure, 3 patients had left ventricular heart failure, 3 patients had stroke, and 4 patients had angina pectoris.

In 40 patients presented with CVD, adults had risk factors such as stress, non-vegetarian diet, obesity and family history more than geriatric patients. It was observed that geriatric patients had social habits, comorbidities, physical inactivity and hypothyroidism as the major risk factors.

10 years CVD risk assessment was performed using JBS3 risk calculator, which depicted that of the remaining 121 patients, 28 adult patients and 33 geriatric patients have a risk of developing CVD. The patients who are at risk of developing CVD were assessed for risk factors. The results indicated that the common risk factors in adults were obesity, stress, non-vegetarian diet, and family history. In geriatric patients risk factors like social habits, comorbidities, physical inactivity and hypothyroidism were found to be common. Table no.2

Table 2: Distribution of patients who are at risk

Distribution of patients who are at risk based on BMI					
Si.No	Based On Bmi	**No.Of Patients**		**Percentage**	
Adults		Geriatrics	Adults	Adults	Geriatrics
1	Yes	5	3	18%	10%
2	No	23	30	82%	90%
	Total	28	33	100%	100%
	P Value =0.312, Not Significant				
	Distribution of patients who are at risk based on Stress level				
1	Low Stress (0-13)	8	4	21%	36%
2	Moderate Stress(14-26)	4	7	14%	21%
3	High Perceived Stress(27-40)	17	11	51%	33%
4	None	4	3	14%	10%
	Total	28	33	100%	100%
	P Value = 0.840, Not Significant				
	Distribution of patients who are at risk based on Physical Activity				
1	Yes	10	8	36%	24%
2	No	18	21	64%	76%
	Total	28	33	100%	100%
	P Value =0.509, Not Sig				
	Distribution of patients who are at risk based on Diet				
1	NON-VEG	24	25	89%	73%
2	VEG	9	3	11%	27%
	Total	33	28	100%	100%
	P Value =0.105, Not Significant				
	Distribution of patients who are at risk based on Social habits				

1	Only Smoking	6	7	21%	21%
2	Only Alcohol	2	1	7%	3%
3	Both	9	7	32%	21%
4	None	11	18	40%	55%
	Total	28	33	100%	100%
	P Value = 0.582, Not Sig				
	Distribution of patients who are at risk based on Family history				
1	Yes	24	26	86%	79%
2	No	4	7	14%	21%
	Total	28	33	100%	100%
	P Value = 0.483, Not Significant				
	Distribution of patients who are at risk based on Lipid profile				
1	Normal	17	19	61%	57%
2	Abnormal	11	14	39%	43%
	Total	28	33	100%	100%
	P Value = 0.803, Not Significant				
	Distribution of patients who are at risk based on Thyroid levels				
1	Normal	23	26	82%	79%
2	Abnormal	5	7	18%	21%
	Total	28	33	100%	100%
	P Value = 0.742, Not Significant				
	Distribution of patients who are at risk based on Co-Morbidities				
1	Only Hypertension	9	4	32%	12%
2	Only Diabetis Miletus	4	3	14%	9%
3	Both	13	25	46%	76%
4	None	2	1	8%	3%
	Total	28	33	100%	100%
	P Value = 0.120, Not Significant				

Statistical analysis

Data was entered into Microsoft Excel (Windows 7; Version 2007) and analyses was done using the Statistical Package for Social Sciences (SPSS) for Windows software (version 22.0; SPSS Inc, Chicago). Descriptive statistics such as mean and standard deviation (SD) were calculated for continuous variables, frequencies and percentages were calculated for categorical variables. Association between variables was analyzed using chi-square test of independence. Bar charts and Pie charts were used for visual representation of the analyzed data. Level of significance was set at 0.05. It was observed from the results obtained that identification of risk factors among adults and geriatrics were not statistically significant. However, JBS3 risk assessment of CVD in the next 10 years was found to be statistically significant. The JBS3 risk scale depicted that geriatrics were more prone to develop CVD compared to the adult population.

CONCLUSION:

Identification of risk factors for cardiovascular diseases in a hospital set up plays an important role in primary prevention and also, prevention of the recurrence of CVD. The present study was aimed to assess the risk factors for cardiovascular diseases among adults and geriatrics. The following observations were noted upon completion of this study:

- Majority of the adult patients had family history of CVD as the most common risk factor.
- Geriatric patients were overweight and obese compared to adults.
- Moderate and high perceived stress was common in both adults and geriatrics.
- More than three fourth of the study patients followed non- vegetarian diet.
- Less than half of the study patients were having social habits such as smoking and alcohol.

- Geriatric patients had prominent abnormal lipid profile when compared to adults.
- Majority of the geriatric patients had more than one comorbidities.
- Hypothyroidism was majorly observed in geriatric patients.
- The risk factors observed were not statistically significant.
- Majority of the geriatric patients had CVD, the common type of CVD was ischemic heart disease and congestive cardiac failure.
- In study patients presented with CVD, the most common risk factors were found to be hypertension, diabetes mellitus ,family history of CVD, social habits of smoking and alcohol, Physically inactivity and non-vegetarian diet which were mostly observed in geriatric patients.
- By using JBS3 Risk Calculation, it was found that geriatrics were more prone to develop CVD which was statistically significant.
- Among the patients who are at risk, the common risk factors identified were hypertension, diabetes mellitus, family history of CVD, social habits of smoking and alcohol, physical inactivity and non-vegetarian diet. Overall, it can be concluded that the risk of developing CVD was greater in geriatrics compared to adult patients. This was statistically significant. Cardiovascular diseases are the leading cause of morbidity and mortality worldwide. Up to 90% of cardiovascular diseases may be preventable if established risk factors are managed. The purpose of assessment of cardiovascular risk factors is to reduce disability and premature deaths. It is found that the risk factors are not the same for the adults and the geriatrics population.

  The CVD risk factors are of two types non-modifiable such as age, gender, family history and modifiable such as hypertension, diabetes mellitus, smoking, alcohol, obesity, diet, high cholesterol, physical inactivity and stress. Institution Ethical Committee clearance was obtained from St. Philomena′s Hospital, Bangalore which was the study site. A prospective and observational study was carried out for a period of 6 months. The objective of the study was to assess the various risk factors associated with cardiovascular diseases among the adult and geriatric patients, also to assess the most common type of cardiovascular diseases in these patients. Identifying the number of patients who are at risk of developing cardiovascular disease in next 10 years by using JBS3 scale and to prepare patient information leaflets to guide the patients in managing the risk factors and counsel the patients. All in-patients and out-patients of both genders were recruited based on inclusion and exclusion criteria. The results of the study showed that the risk factors like stress, diet and family history are more common in adults whereas, risk factors like obesity, physical inactivity, social habits, high cholesterol levels, co-morbidities like hypertension, diabetes mellitus and hypothyroidism are more common in geriatrics. However, they are insignificant based on statistical analysis.

Out of 161 patients it was found that 40 study subjects had already developed CVD. It was observed that IHD and CCF are the most common cardiovascular disease in the study population in which geriatrics are most affected. Among 40 CVD patients the risk factors like high cholesterol, family history, diet, stress is more in adults where as co-morbidities like hypertension, diabetes mellitus and hypothyroidism are higher in geriatrics and risk factors like obesity, social habits, physical inactivity are common in both adults and geriatrics although they were found to be statistically insignificant.

By using JBS3 scale it was found that 61 patients are at risk of developing CVD in next 10 years in which geriatric patients are more in number, which is statistically significant. In this patients, risk factors like physical inactivity, high cholesterol level, co-morbidities are higher in geriatrics.

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