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Original Research Paper

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TO STUDY THE CARDIOVASCULAR RISK FACTORS IN PATIENTS WITH CHRONIC SCHIZOPHRENIA WHO ARE RECEIVING TREATMENT AND NOT RECEIVING TREATMENT

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ABSTRACT

OBJECTIVE: To assess the cardiovascular risk in chronic schizophrenia(duration >2 yrs) patients with and without treatment.

MATERIALS AND METHODS: 100 OPD patients (aged 20 or above,both male or female), who were diagnosed with chronic schizophrenia(duration >2yrs) with and without treatment according to the International Classification of Diseases Classification of Mental and Behavioral Disorders Diagnostic criteria for research 10th revision. Those patients were evaluated for the coronary heart disease (CHD) risk as per Framingham (10 year all CHD events) function/risk equation.

RESULTS: Intermediate cardiovascular risk was found in 2% without treatment patients and 5.73% in with treatment patients. Compared to females, males had higher Framingham score (4.08± 4.51 vs. 1.07± 0.26, likelihood ratio= 622.19, P value < 0.05 in with treatment patients and 1.63± 1.67 vs. 1.11± 0.48,likelihood ratio= 6.444, P value > 0.05 in without treatment patients)

CONCLUSION: Patients of schizophrenia have a high prevalence of cardiovascular risk factors. Hence, there is a need to screen the patient of schizophrenia for the cardiovascular risk and manage it as early as possible.

KEYWORDS : Cardiovascular Risk, Mortality, Schizophrenia

INTRODUCTION:

Schizophrenia is really one of the most perplexing but disabling of all brain diseases, with its severity and persistency of psychotic manifestations accompanied by means of variable cognitive dysfunction and profound psychosocial impairment. The onset of disease, at least of the psychotic manifestations, happens two in late adolescence/ early adulthood. Symptomatology is regularly undetectable in early life, are at their worst at some stage in child-bearing years, and often improve, to a degree, with aging. People with psychosis, go through notably for the duration of existence and medical requirement globally continues to be very high.[1] In 1959, a period when tobacco use was at its highest level, Abraham published "Cardiovascular Disease in Psychotics," which showed an increased prevalence of atherosclerotic and hypertensive CVD in hospitalized patients with schizophrenia. He rejected the popular view of the time that "the protective life of people with schizophrenia seems to guard them from early onset of degenerative diseases of the heart." By the late 1970s, accumulating mortality data from psychiatric patients showed a consistent pattern of increased mortality rates relative to the general population. However, despite such reports there were only a few controlled studies in that period that aimed to understand the causes and contributions to this excess mortality.[2] CVD is also the leading cause of mortality in individuals with schizophrenia, who are even more likely to experience premature cardiovascular mortality than individuals in the general population. The prevalence of CVD in people with schizophrenia is approximately two- to threefold increased, particularly in younger individuals. In a retrospective cohort study conducted by Curkendall and colleagues, 3,022 individuals with schizophrenia were compared to a general population cohort. The overall prevalence of CVD was increased in the patients with schizophrenia (10.6 vs. 8.7 percent), as was with the incidence of ventricular arrhythmia (odds ratio [OR] = 2.3; 95 percent confidence interval [CI], 1.2 to 4.3), stroke (OR = 1.5; 95 percent CI, 1.2 to 2.0), diabetes (OR = 1.8; 95 percent CI, 1.2 to 2.6), and heart failure (OR = 1.6; 95 percent CI, 1.2 to 2.0). Cardiovascular mortality in schizophrenia has also been evaluated in large population-based samples using long periods of observation. Patients with schizophrenia were evaluated for mortality risk over a period of 19 years in a Swedish registry study, analyzed by Osby and colleagues. Between 1976 and 1991, death rates due to CVD increased 4.7-fold in men and 2.7-fold in women.[2] Correll et al. reported a 10-year CHD risk of 6.5% for inpatients with schizophrenia (n = 111). They also reported that 23.4% of patients with schizophrenia had a CHD risk more than equal to 10%.[4] In the Clinical Antipsychotic Trials of Intervention Effectiveness study, it was observed that patients with schizophrenia had significantly higher 10-year risk of CHD than the general population (9.4% vs. 6.3% in males and 7% vs. 4.2% in females).[5] These findings were replicated in a later study too.[3] Other studies reported 10-year CHD risk of 6.5-7.2% and CMR to be 0.9% in patient with schizophrenia[4,6] with high/very high risk of CHD (≥10%) in 22-23% patients with schizophrenia[4,6] and high CMR risk (≥5%) in 6.5-8% patients with schizophrenia.

MATERIALS AND METHODS:

The study was approved by the Ethics Review Committee of the Institute .The patient was incompetent on account of the severity of illness to provide informed consent, then informed consent from the LAR of the patient was taken. The study was conducted by including patients above age 20years at the OPD of department of psychiatry MGM medical college Indore. The participants were screened for the following predefined inclusion and exclusion criteria. Patients were diagnosed for schizophrenia according to the International Classification of Diseases - Classification of Mental and Behavioral Disorders - Clinical Descriptions and Diagnostic criteria for research 10th revision[18] were invited to participate in the study. Sociodemographic and clinical details of all subjects were recorded in structured formats. The Study design was the cross sectional study in which study sample was the 100 patients. Who were divided into two groups- 1) 50 Chronic Schizophrenic patients whose illness is more than 2 years and who are taking the treatment for the illness. 2) 50 Chronic Schizophrenic patients whose illness is more than 2 years and who are not taking the treatment for the illness. The study was conducted at department of psychiatry MGMMC Indore for one year from date of ethics committee approval.

ASSESSMENTS:
By using standard mercury manometer systolic and diastolic blood pressure was measured. Fasting venous blood sample was collected under aseptic condition to estimate cholesterol, triglycerides (TGA) and high-density lipoprotein (HDL).

ANALYSIS OF CARDIOVASCULAR RISK WITH THE FRA MI NGHAM/ATP III CRITERIA
The Framingham/ATP III criteria had been used to estimate CHD risk in the USA. Data from 11,611 patients from a very large study, the NHANES III, have been used. [275] High risk used to be most many times found in patients with advanced age, and used to be more frequent in men than women. High risk patients are once in a while emerge as unknown with clinical features of cardiac failure Scoring.

FRAMINGHAM RISK SCORE FOR WOMEN
AGE:
20–34 years: Minus 7 points. 35–39 years: Minus three points. 40–44 years: zero points. 45–49 years: three points. 50–54 years: 6 points. 55–59 years: 8 points. 60–64 years: 10 points. 65–69 years: 12 points. 70–74 years: 14 points. 75–79 years: sixteen points.

Total cholesterol, mg/dL: Age 20–39 years: Under 160: zero points. 160-199: four points. 200-239: eight points. 240-279: eleven points. 280 or higher: thirteen points. Age 40–49 years: Under 160: zero points. 160-199: 3 points. 200-239: 6 points. 240-279: 8 points. 280 or higher: 10 points. Age 50–59 years: Under 160: zero points. 160-199: 2 points. 200-239: four points. 240-279: 5 points. 280 or higher: 7 points. Age 60–69 years: Under 160: zero points. 160-199: 1 point. 200-239: 2 points. 240-279: 3 points. 280 or higher: four points. Age 70–79 years: Under 160: zero points. 160-199: 1 point. 200-239: 1 point. 240-279: 2 points. 280 or higher: 2 points.

IF CIGARETTE SMOKER: Age 20–39 years: 9 points. Age 40–49 years: 7 points. Age 50–59 years: four points. Age 60–69 years: 2 points. Age 70–79 years: 1 point.

ALL NON SMOKERS: zero points.

HDL CHOLESTEROL, MG/DL: 60 or higher: Minus 1 point. 50-59: 0 points. 40-49: 1 point. Under 40: 2 points.

Systolic blood pressure, mm Hg: Untreated: Under 120: zero points. 120-129: 1 point. 130-139: 2 points. 140-159: three points. one hundred sixty or higher: four points. Treated: Under 120: zero points. 120-129: 3 points. 130-139: four points. 140-159: 5 points. a hundred and sixty or higher: 6 points. 10-year risk in %: Points total: Under 9 points: <1%. 9-12 points: 1%. 13-14 points: 2%. 15 points: 3%. sixteen points: 4%. 17 points: 5%. 18 points: 6%. 19 points: 8%. 20 points: 11%. 21=14%, 22=17%, 23=22%, 24=27%, >25= Over 30%

FRAMINGHAM RISK SCORE FOR MEN
AGE:
20–34 years: Minus 9 points. 35–39 years: Minus 4 points. 40–44 years: zero points. 45–49 years: three points. 50–54 years: 6 points. 55–59 years: eight points. 60–64 years: 10 points. 65–69 years: 11 points. 70–74 years: 12 points. 75–79 years: thirteen points.

Total cholesterol, mg/dL: Age 20–39 years: Under 160: zero points. 160-199: four points. 200-239: 7 points. 240-279: 9 points. 280 or higher: eleven points. Age 40–49 years: Under 160: zero points. 160-199: three points. 200-239: 5 points. 240-279: 6 points. 280 or higher: eight points. Age 50–59 years: Under 160: zero points. 160-199: 2 points. 200-239: 3 points. 240-279: four points. 280 or higher: 5 points. Age 60–69 years: Under 160: zero points. 160-199: 1 point. 200-239: 1 point. 240-279: 2 points. 280 or higher: three points. Age 70–79 years: Under 160: zero points. 160-199: zero points. 200-239: 0 points. 240-279: 1 point. 280 or higher: 1 point.

IF CIGARETTE SMOKER:
Age 20–39 years: eight points. Age 40–49 years: 5 points. Age 50–59 years: 3 points. Age 60–69 years: 1 point. Age 70–79 years: 1 point.

ALL NON SMOKERS: zero points.

HDL CHOLESTEROL, MG/DL:
60 or higher: Minus 1 point. 50-59: 0 points. 40-49: 1 point. Under 40: 2 points.

SYSTOLIC BLOOD PRESSURE, MM HG:
Untreated: Under 120: zero points. 120-129: 0 points. 130-139: 1 point. 140-159: 1 point. 160 or higher: 2 points. Treated: Under 120: zero points. 120-129: 1 point. 130-139: 2 points. 140-159: 2 points. 160 or higher: 3 points.

10-YEAR RISK IN %:
Points total: 0 point: <1%. 1-4 points: 1%. 5-6 points: 2%. 7 points: 3%. 8 points: 4%. 9 points: 5%. 10 points: 6%. 11 points: 8%. 12 points: 10%. 13 points: 12%. 14 points: 16%. 15 points: 20%. sixteen points: 25%. 17 factors or more: Over 30%.[7]

STATISTICAL ANALYSIS
The SPSS version 14.0 for Windows (Chicago, Illinois, USA) was used for analysis. Frequencies with percentages were calculated for nominal and ordinal variables and mean, and standard deviation were calculated for continuous variables. Chi-Square test and t-test were used for comparisons. For variables with a skewed distribution, nonparametric tests like Mann–Whitney U-test, test for proportion and Fisher exact test were used for comparison.

RESULTS:
During the study period of 1 year (2018 to 2019), 100 patients were assessed on the OPD basis. 50 of them were without treatment and 50 of them were with treatment chronic schizophrenia patients. All of them/their caregivers provided informed consent to participate in the study.

SOCIODEMOGRAPHIC AND CLINICAL PROFILE OF THE SAMPLE
Average age of without treatment schizophrenic patients was 32.16 yrs and with treatment schizophrenic patients was 39.17 yrs.Mean age of onset was 26.53 yrs in without treatment schizophrenic patients and 25.70yrs in with treatment schizophrenic patients. Mean duration of illness was 6.21 yrs in without treatment schizophrenic patients and 13.74 yrs with treatment schizophrenic patients.male patients were 33 and female patients were 17 in both with and without treatment. majority of the patienuts were hindu. Most of the patients were from low socioeconomic status (74% in without treatment and 76% in with treatment patients).most of the patients wer unemployed (84% in without treatment and 78% in with treatment patients. Most of the patients were urban (67.5% in with treatment and 56% in without treatment patients)

Intermediate cardiovascular risk was found in 2% without treatment patients and 5.73% in with treatment patients. Compared to females, males had higher Framingham score (4.08± 4.51 vs. 1.07± 0.26, likelihood ratio= 622.19, P value < 0.05 in with treatment patients and 1.63± 1.67 vs. 1.11± 0.48,likelihood ratio= 6.444, P value > 0.05 in with treatment patients).

There is no statistically significant difference in the systolic and diastolic blood pressure of with treatment and without treatment schizophrenic patients.

There is no statistically significant difference in the blood parameters(HDL,TG and serum cholesterol) of with treatment and without treatment schizophrenic patients.

Comparison of socio demographic profile between with treatment schizophrenic patients and without treatment schizophrenic patients

Variables	Without treatment schizophrenia patients	With treatment schizophrenia patients
Age M:F	32.16 1.9 : 1 (M= 33,F=17)	39.47 1.9 : 1 (M= 33,F=17)
Marital status in %: Married Unmarried Divorced Widowed separated	 38% (n=19) 48%(n=24) 4%(n=2) 0%(n=0) 10%(n=5)	 35.3%(n=18) 28.7%(n=14) 17.5%(n=9) 4.7%(n=2) 13.9%(n=7)
Religion in %: Hindu Muslim	 90%(n=45) 10% (n=5)	 91.4%(n=46) 8.6% (n=4)
Education in %: Illiterate Primary(5th) Middle(8th) High School Inter/Diploma Graduate Post graduate Professional	 14%(n=7) 20%(n=10) 26%(n=13) 10%(n=5) 18%(n=9) 8% (n=4) 4%(n=2)	 17.6%(n=9) 10.9%(n=5) 23.5%(n=12) 25.8%(n=13) 12.5%(n=6) 7.7% (n=4) 2%(n=1)
Socioeconomic – Low Middle High	 74%(n=37) 24%(n=12) 2% (n=1)	 76%(n=38) 22%(n=11) 2% (n=1)
Occupation- Employed unemployed	 16%(n=8) 84% (n=42)	 22%(n=11) 78% (n=49)
Family type Nuclear Extended/ Joint.	 58%(n=29) 42% (n=21)	 41.9%(n=21) 58.1% (n=29)
Locality Urban Rural	 56%(n=28) 44% (n=22)	 67.5%(n=34) 32.5% (n=16)
Age of onset in years.(mean)	26.53	25.70
Total duration of illness in years.(mean)	6.21	13.74
Cardio vascular risk (intermediate risk)	2%(n=1)	5.73%(n=3)
Cardio vascular risk (low risk)	98%(n=49)	94.24% (n=47)
Smoking	24%(n=12)	24.01%(n=12)
Tobacco chewing	30%(n=15)	40%(n=20)

Tests for proportion for "with treatment schizophrenic patient"

Correlations		N	Mean ± SD in males	Mean ± SD in females	Pearson value	P value	Likelihood ratio	Exact sig
sex	Percentage CVD risk	50	4.08±4.51	1.07± 0.26	464.21	0.00	622.19	--

Tests for proportion for "without treatment schizophrenic patient"

Correlations		N	Mean ± SD in males	Mean ±SD in females	Pearson value	P value	Likelihood ratio	Exact sig
sex	Percentage CVD risk	50	1.63± 1.67	1.11± 0.48	4.248	0.373	6.444	---

Comparison of parameters of physical examination between with treatment and without treatment schizophrenic patients

Variables	Patients Without treatment (mean±SD)	Patients With treatment (mean±SD)	correlation	Sig (2 tailed)
SBP (mm Hg)	124.80±18.89	124.12±15.26	0.07	0.842
DBP(mm Hg)	79.06± 13.49	77.57± 11.64	0.16	0.536

Comparison of blood parameters between with treatment and without treatment schizophrenic patients

Variables	Patients Without treatment (mean±SD)	Patients With treatment (mean±SD)	correlation	Sig (2 tailed)
Triglyceride (mg/dl)	124.14±67.34	135.65±72.43	0.25	0.362
Cholesterol (mg/dl)	170.25±41.55	179.78±37.65	-0.01	0.254
HDL (mg/dl)	44.93±13.28	45.06±12.66	-0.05	0.963

DISCUSSION:

Findings with respect to coronary heart disease risk (Framingham score) for patients with schizophrenia in the present study is similar to Sandeep grover et al study however it is less than that reported from the West (6.5-11.3%).[8,9,10] The major reason for this difference could be a lower age and lower prevalence rate of smoking in Sandeep grover's study compared to those evaluated in studies from the West,[9,11] in which the mean age of the study groups was 40.7 years[9,11] and the percentage of smokers varied from 53.7[9] to 58.[11] This findings also suggest that age is an important variable which influences the Framingham risk score.[12] This suggests that possibly with age and treatment the coronary heart disease risk increases in patients with schizophrenia. Studies from different ethnic groups and that from India have reported prevalence rate of metabolic syndrome to be 9-68% in patients with schizophrenia.[10]

In our study cardiovascular risk was higher in male patients than female patients in with treatment schizophrenia patients, which was statistically significant and metabolic syndrome was present more in female patients than male patients in with treatment schizophrenia patients, which was also statistically significant. but cardiovascular risk was higher in male patients than female patients in without treatment schizophrenia patients.

As per Denial bressington et al exposure to endogenous oestrogens during the fertile period of life delays the manifestation of atherosclerotic disease in women. Before menopause the coronary heart disease event rate in women is low and predominantly attributed to smoking.3 Women with an early menopause (<40 years) have a two-year lower life expectancy compared with women with a normal or late menopause. [13,14,15]

CONCLUSION:

On the basis of available literature and results of index study , which substantiate the earlier findings, it can be concluded that: Cardiovascular risk causes significant morb idity and mortality in schizophrenic patients .There is no significant difference in the physical and blood parameters of with treatment and without treatment schizophrenia patients. Age , duration of the treatment, duration of illness, smoking and severity of illness affect cardiovascular risk and metabolic syndrome in schizophrenia patients. Male patients had more risk for cardiovascular disease than female patients.

LIMITATIONS AND FUTURE DIRECTIONS:

The limitations of the present study are cross-sectional design, inclusion of out patients only, which had lack of healthy control group. We also did not assess the effect of lifestyle factors, physical activity, dietary factors and family history of diabetes, all of which can confound the prevalence of cardiovascular risk in schizophrenia patients. the study was also constrained by the lack of validation of the cardio vascular risk scores used for 10year risk projection in the Indian population (the framingham risk score is based on data from white people, whereas score was developed for European populations). In future studies with the longitudinal design should try to overcome the limitations of this study. Only selecting patients visited in out patient care, involved a selection bias, as the sample was not representative of the entire population. However, examining this sub-population could be interesting for the development of preventive strategies that are focused on primary care. The study was conducted at a single center and was confined to out patients with chronic disease. It may not, therefore, reflect the true cardiovascular risk of all patients with schizophrenia in community.

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