Original Study

Effect of Risperidone on Lipid Profile and Related Risk for Coronary Heart Disease

P. V. Paunipagar, *Associate Professor*,
Department of Biochemistry, Raichur Institute of Medical Sciences, Raichur, Karnataka.

Anil Gumaste, *Assistant Professor*,
Department of Psychiatictry, Raichur Institute of Medical Sciences, Raichur, Karnataka.

Rahul Sharma, *Student*,
Raichur Institute of Medical Sciences, Raichur, Karnataka.

Abstract

Present study was carried out in a view to studing the effect of Risperidone used for treatment of Schizophrenia on Lipid Profile and, its related risk for coronary heart disease, in 30 patients on Risperidone and compared with 30 age and sex matched healthy controls. We found that this drug significantly does not increase the risk for coronary heart disease in patients with respect to lipid profile and other parameters as described by Framingham study group by estimating Framingham Point Scores. Nor it has much effect on lipid profile, except that triglyceride shows significantly higher levels (187.1 ± 24.73) as compared to controls (135.9 ± 25.05) with p value <0.001**.** Altogether, this drug is safe for these patients, but long-term implications of these findings need to be studied, as prevalence of CHD is increasing day-by-day due to the globalization.

Keywords

risperidone, schizophrenia, lipid profile, coronary heart disease

Introduction

Schizophrenia, a mental disorder characterized by a disintegration of the process of thinking and of emotional responsiveness, is a heterogeneous syndrome characterized by perturbations of language, perception, thinking, social activity, affect, and volition. It is present in 0.85 %[1] of individuals worldwide, and 0.23% in Indian population[2]. The best prognosis is associated with antipsychotic medication soon after the onset of this mental disorder. Second generation atypical antipsychotics like Risperidone[3,4] was introduced in 2007 with usual daily dose of 2-6 mg. One of the side effects of this particular drug is weight gain which is an associated risk factor for Coronary Heart Disease.

Coronary Heart Disease is defined as "impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart. Framingham heart study[5], started during 1950s, has played a major role in establishing the nature of CHD risk factors and their relative importance. The major risk factors of CHD are elevated serum cholesterol, smoking, hypertension, and sedentary habits.

Address for correspondence: Dr Prashant Paunipagar, G-5, RIMS Teaching Staff Quarters, RIMS Campus, Hyderabad Road Raichur - 584102, Karnataka.E-mail : drprashantcims@indiatimes.com

Therefore, there may be some relation between patients receiving these drug and their risk for CHD. Hossein Khalili, *et al*, 2007[6], reported on 'Effect of Risperidone on lipid profile in 70 adult patients'. According to the study, overall Total cholesterol (TC) and triglyceride (TG) levels did not change significantly. However, TC concentrations significantly decreased in 48.9% and increased in 51.1% subjects, while TG levels significantly decreased in 53.2% and increased in 46.8% patients. Hence present study was carried out in a view to determine Association between long term use of Risperidone & changes in Lipid / Cholesterol metabolism and also to find magnitude of risk for coronary heart disease as an effect of alteration in Lipid / Cholesterol metabolism by these drug if any.

Materials and Methods

Study Design: Cross-sectional study.

Setting : Psychiatry OPD and Department of Biochemistry of Raichur Institute of Medical Sciences, Raichur (Karnataka).

Study Subjects : 60 subjects aged between 20 - 40 years. 30 Schizophrenia patients exclusively on Risperidone, compared with 30 age and sex matched Healthy Controls.

Diagnostic Criteria: Mental Disorder (Schizophrenia): The subjects are classified as per DSM –IV (Diagnostic and Statistical Manual of Mental Disorder- 4th edition)

Estimation of Lipid Profile : Lipid profile estimation done using Randox kits by Daytona Randox fully automated analyzer.

Estimating the risk for coronary heart disease: Framingham Point Scores were estimated by taking into consideration several parameters *i.e.* Age, Sex, Systolic blood pressure, HDL levels, Total cholesterol, and smoking history, as per guidelines from FRAMINGHAM HEART STUDY group[6].

Statistical Analysis:

Data collected was analyzed using student t-test and chi square test.

Observations and Results

Estimation of Lipid profile in Schizophrenia patients and there Framingham score and related risks are tabulated in following **(Tables 1**, **2** & **3).**

Table 1
Lipid Profile in Schizophrenia patients on Risperidone, compared with Controls

(mg/dl)	Control (n = 30)	Cases (n = 30)
Total Cholesterol	170.2 ± 20.87	172.2 ± 21.11
HDL	48.8 ± 8.11	47.43 ± 7.04
LDL	98 ± 20.13	100.2 ± 21.67
Triglycerides	135.9 ± 25.05	187.1 ± 24.73***

***Student t-test, p<0.001, as compared to control.

Table 2
Age & Sex wise Distribution of Schizophrenia patients on Risperidone

Age Group	(mg/dl)	Male (n = 10)	Female (n = 3)
20-30 yrs	Total Cholesterol	173.41 ± 20.01	167.37 ± 21.45
	HDL	48.84 ± 8.31	45.16 ± 5.34
	LDL	93.12 ± 19.33	102.34 ± 24.31
	Triglycerides	181.30 ± 27.80	178.83 ± 19.70
		Male (n = 11)	Female (n = 6)
30-40 yrs	Total Cholesterol	168.10 ± 22.86	185 ± 23.38
	HDL	45.20 ± 6.89	54 ± 1
	LDL	110 ± 21.63	94 ± 26.85
	Triglycerides	187.21 ± 25.01	207.34 ± 14.36

Discussion & Conclusion

Risperidone drugs used in the treatment of Schizophrenia is a newer 'atypical', or 'second-generation', neuroleptic and is more selective than the older 'typical' neuroleptics. Risperidone can bind to dopamine D2, 5-HT2 and a 2 adrenergic receptors in the brain. The efficacy of neuroleptics is thought to be due to antagonism of dopamine receptors in the mesolimbic and mesofrontal systems. The atypical neuroleptics, which have little or no affinity for D1 receptors, do not exhibit some of the side effects associated with D1 antagonism that the older neuroleptics have. The adverse effects associated with atypical neuroleptics, such as tachycardia, impotence and dizziness, are due to the non selective binding to adrenoreceptors[7].

Table 3
Framingham point scores depict the estimated 10-year % risk fordevelopment of Coronary heart disease in Schizophrenia patients on Risperidone

Total Point Score	% Risk	No. of Female Patients	No. of Male Patients
<0	<1	7	11
0-4	1	2	6
5-6	2	0	1
7-8	3-4	0	1
9	5	0	0
>9	>6	0	2 *
Total no. of Patients(30)	9	21	

*Only 2 Male Smokers, Schizophrenia patients on Risperidone are having the risk of more than 6% for Coronary heart disease.

If Risperidone increases the risk of Coronary Heart Disease, it might lead to increase in patients burden which they are already having. Hence present study was carried out to evaluate the safety or risk of these drug. For this purpose, we evaluated lipid profile in patients between age group of 20-40 years, receiving Risperidone since last 6 months. From the study it was found, statistically significant increase in Triglyceride levels in patients receiving Risperidone (n = 30) [187.1 ± 24.73 mg/dl], as compared to age and sex matched controls (n = 30) [135.9 ± 25.05 mg/dl], showing p-value < 0.001. Other parameters of lipid profile did not show any significant change in results compared with control. Our results are consistent with the findings reported by Hossein Khalili *et al* (2007)[6]. Increase in Triglyceride level might be due to the fact that Risperidone interacts particularly with serotonin 5-HT_{2A} receptor, 5-HT_{2C} receptors and histamine H_1, leading to metabolic disturbances[8].

Framingham Point score reveals score more than 6% only in 2 patients, who were taking Risperidone, which might be due to their chronic smoking habits, as reported by Wolf PA *et al*.[9]. Whereas in all other patients who were on Risperidone, score was less than 5%, which reveals the safety of these drug.

Finally from our present study, we concluded that Risperidone used in the treatment of Schizophrenia is less prone to increase the risk for Coronary Heart disease. Hence, routine lipid profile estimation is not mandatory. However, due to various other predisposing factors for the risk of CHD, periodic Lipid Profile estimation in Schizophrenia patients on Risperidone should be done, as prevalence of CHD is increasing day-by-day due to increased Globalization.

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