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RESEARCH ARTICLE

METABOLIC EFFECT OF RISPERIDONE IN PSYCHIATRIC PATIENTS

Dr. G. Sasikala

Assistant professor, Govt Kilpauk Medical College, Chennai 10, India

Email: sasikala.shri@gmail.com

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ABSTRACT

Aim & Objective: This study was designed to evaluate the metabolic effects of risperidone in patients with psychiatric illness treated with risperidone.
Method: Thirty non-diabetic patients with Psychiatric illness (e.g. schizophrenia, manic phase of bipolor disorder based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria) inducted in this study. These Patients did not receive any drug that would alter the blood sugar levels and also risperidone for at least four weeks prior to the initiation of the study. All the patients who were inducted in this study receive the mean dose of 4mg/day (range 2-8 mg) of risperidone for eight weeks, depending upon the clinical condition. The patients fasting, post prandial blood sugar and weight gain were evaluated at the baseline and then at four weeks and at eight weeks.
Results: Thirty patients completed the study. The mean fasting blood sugar level was increased from 87.5mg/dL (baseline) to 101.7 mg/dL at week 8 (P<0.001).The mean post prandial blood sugar was increased from111.68 mg/dl to147.88 mg/dl at week 8 (p<0.001).There was also statistically significant weight gain with a increase in mean weight of59.16 kg to59.96 kg (p=0.001). The 8-week study showed that fasting blood sugar and postprandial blood sugar levels may increase in psychiatric patients receiving risperidone .There was also definite weight gain. No serious adverse events were reported.
Conclusion: Measuring and monitoring fasting & postprandial blood sugar before the initiation and during the treatment with risperidone is suggested.
Key Words: Metabolic effect, Risperidone , Blood glucose, psychiatric illness.

INTRODUCTION

Phenothiazines and other older antipsychotics drugs are being replaced by atypical antipsychotics. Atypical antipsychotics have a low risk of adverse extra pyramidal effect. The effectiveness against negative and positive symptoms of schizophrenia is attributed to their high affinity to 5HT2A and D4 receptor and also antagonistic action against alpha adrenergic, muscarnic& H_1 and D_2 receptor[1]. Weight gain is common with Phenothiazines, Haloperidal, Thioxanthenes and Atypical antipsychotics like olanzapine, Clozapine. Weight gain is less common with Risperidone, Quetiapine Ziprasidone which are also atypical antipsychotics. Psychiatric patients need long term treatment with antipsychotics. Weight gain produced by antipsychotics may increase the risk of new onset Type2Diabetes mellitus[2]. Weight gain and development or exacerbation of Diabetes mellitus are serious issues that have forced clinicians to vigilantly follow up their patient's metabolic profile to prevent serious consequences[3].Studies have shown that use of risperidone in non diabetic schizophrenic patients cause increase in the levels of fasting blood sugar levels from the baseline values .Hence this study stresses the monitoring of the fasting blood sugar during the treatment with risperidone. Many drugs cause diabetes mellitus and these are antipsychotics risperidone, olanzepine, clozapine in particular, and also other drugs like thiazide, B blockers, corticosteroids phenytoin sodium, tacrolimus , estrogen ,progesterone preparation and certain antidepressents.[4] US regulators have proposed that 6 antipsychotics medication can increase the risk of impaired glucose tolerance and diabetes. These drugs are risperidone ,olanzepine , clozapine, quetiapine,ziprazidone,aripiprazole[5] .Hence it was decided to conduct a study using risperidone in non diabetic psychiatric patients to find out if risperidone really causes changes in glucose tolerance, and has been designed accordingly.

In this study already known diabetics and those diagnosed to have diabetes mellitus at the time of study were not included because this study is to find out the effect of risperidone on blood sugar level who are having normal blood sugar level . If it is found out Risperidone produces Carbohydrate intolerence ,then the study could also be conducted on diabetics.

METHODOLOGY

Study design: Prospective, non comparative, open label study

Place of study: Dept of Psychiatry Government Stanley medical college & Hospital. Chennai-1

Study population: 30

Study duration : 8 weeks per patient

Study period : November2012_April2013

Inclusion criteria:

1. All psychiatric patients who would benefit from risperidone.

(e.g. schizophrenia, manic phase of bipolor disorder)

2. Both sexes

3. Age: 30-65years

4. Patient without preexisting Diabetes mellitus / hypertention

5. Psychiatric patients with near normal dietary intake

Exclusion criteria:

1. All old cases who are already on antipsychotics

2. Those who are on diabetes mellitus/hypertension treatment

3. Age: less than 30 years or more than 65 years

4. Those with other systemic illness

5. Acute uncontrollable cases of psychosis

After obtaining institutional ethical committee approval, thirty adult non diabetic patients with psychiatric illness (based on diagnostic and statistical manual of mental disorders, fourth edition criteria) were enrolled after obtaining informed consent and with the consent of legal guardian in this study. Subjects were between30_65 years .Patients did not receive any other antipsychotics or any other medication that could affect blood sugar levels (e .g) corticosteroids, B blockers, sulfonylureas, insulin, metformin, antidepressants ,etc for two weeks prior to initiation of the study and during the study period. Patients were received a mean of 4mg per day of risperidone for 8 weeks (Range of 2mg_8mg). Before starting therapy patient's body weight, fasting blood sugar, postprandial blood sugar were recorded.

The blood sugar levels were monitored at beginning of the study, 4 weeks and at 8 weeks and reports were analyzed. Results were presented asmean ± standard error. Results were analyzed using paired sample t test. Differences were considered significant when P value of <0.05.

Sex distribution:

Table 1: shows the sex distribution among the study patients.

		Frequency	Percent	Valid Percent
Valid	Male	20	62.0	62.0
	Female	10	38.0	38.0
	Total	30	100.0	100.0

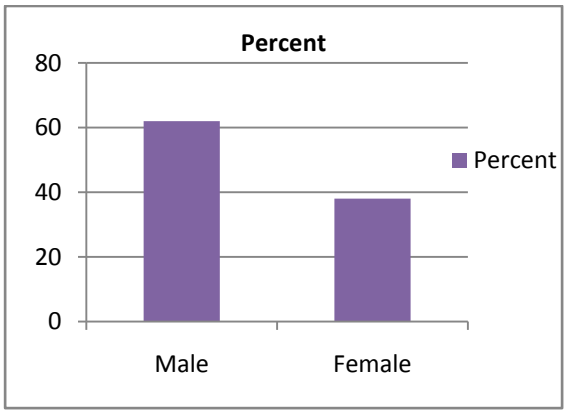

Figure1: Bar diagram representing the percentage of sex distribution

Mean age of the participants were 52. Among this sixty two percent were male and thirty eight percent were female. Twenty males and ten females completed the study.

Mean fasting blood sugar level:

Table 2: Shows the increase in mean fasting blood sugar level from baseline to eight weeks.

	Mean	Std. Deviation	Minimum	Maximum
FBS_BL	87.56	8.650	60	98
FBS_4w	94.56	5.870	76	100
FBS_8w	101.76	4.809	86	110

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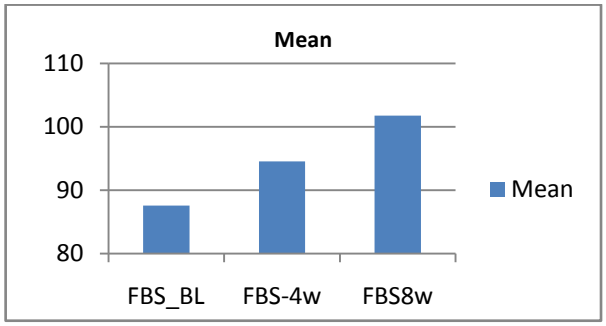

Figure 2: Shows the Bar diagram representing the increase in the mean fasting blood sugar level
FBS-BL _Fasting blood sugar-baseline
FBS-4W - Fasting blood sugar-4th week
FBS-8W_ Fasting blood sugar-8th week

The mean FBS level was increased from87.56 mg/dl (baseline) to 94.56mg/dl at 4week and 101.76mg/dl at 8weeks.The FBS levels at 8 weeks were significantly different from baseline FBS levels (p<0.001)

Mean postprandial blood sugar:

Table 3: Shows the increase in mean post prandial blood sugar level.

	Mean	Std. Deviation	Minimum	Maximum
PPBS_BL	111.68	7.366	90	120
PPBS_4w	127.12	8.253	100	140
PPBS_8w	147.88	7.411	136	170

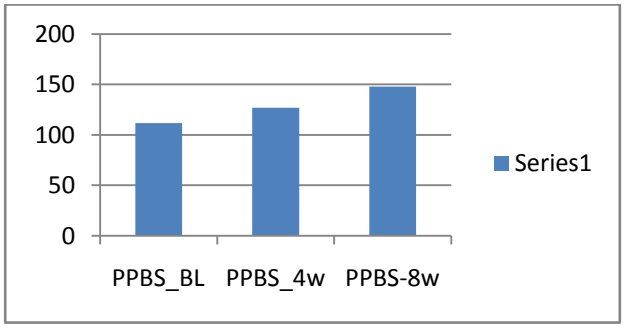

Figure 3: Bar diagram representing the mean increase in the mean postprandial blood sugar level.
PPBS-BL _Fasting blood sugar-baseline
PPBS-4W - Fasting blood sugar-4th week
PPBS-8W_ Fasting blood sugar-8th week

The mean PPBS was increased from111.68 mg/dl (baseline) to127.12mg/dl at 4week and 147.88 mg/dl at 8week.The PPBS level at 8week were significantly different from baseline PPBS level (p<0.001)

Mean body weight:

Table 4: Represents the mean increase in the body weight from baseline to 8week

	Mean	Std. Deviation	Minimum	Maximum
BW_BL	59.16	6.693	46	69
BW_4w	59.49	6.703	46	69
BW_8w	59.96	6.718	46	69

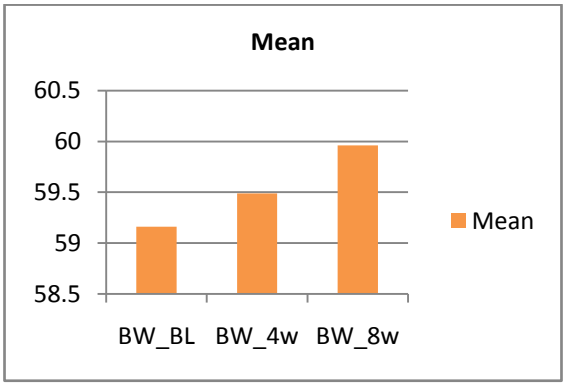

Figure 4: Bar diagram represents the mean increase in the body weight
BW-BL _ Body weight baseline
BW-4W – Body weight-4th week
BW-8W_ Body weight-8th week

The patient's Bodyweight was increased from59.16 (baseline) to59.49 at4 weeks and59.96 at 8weeks.The weight gain was statistically significant (p=0.001)

DISCUSSION:

In this study the effect of risperidone on blood glucose level in non diabetic patients of psychiatric illness showed there was significant increase in both fasting and post prandial blood glucose level at the end of 4weeks and at the end of 8 weeks. Though there is increase in both FBS and PPBS level in patients treated with risperidone, at the end of 4week and at the end of 8week,the increases are well within normal limits. There was also statistically significant increase in body weight as shown in the table.

The mechanism by which risperidone causes increase in blood sugar level was not fully understood. However the proposed mechanisms are; weight gain, insulin resistence increase in leptins concentration and glucose transport impairment [6].

Therefore regular monitoring of blood glucose before starting risperidone to prevent further complication is necessary.

The studies show that there is definite increase in FBS, PPBS in patients who have given risperidone .As noted already all the patients were non diabetics.

The effect of risperidone in blood sugar level in patients who are preexisting diabetics has not been studied till now. In such cases risperidone and other antipsychotics as mentioned in the initial part of the study, may aggravate preexisting diabetics, when risperidone is given to treat the psychiatric illness.

This may interferes with control of blood glucose level and it may be necessary to increase the dosage of anti diabetic drugs. In this study it has been shown risperidone definitely impairs glucose tolerance. Only further studies can establish the role of risperidone in interfering glucose tolerance.

From this study it has also transpired that blood sugar levels should be estimated in all the patients receiving risperidone, if not, in all the patients at least in those who are potentially diabetics .Since atypical antipsychotics

becoming popular blood sugar monitoring also becoming essential. Since the drug also causes weight gain, only further studies can prove, if risperidone causes weight gain in diabetics also.

Some anti diabetics (sulfonylureas) cause weight gain, so combined effects of anti diabetics and risperidone also should be evaluated. Such studies will establish the link between risperidone and rise in blood sugar level and weight gain.

In this present study, patients are receiving different doses of risperidone ranging from 2mg to 8 mg , where another study is required ,in such a way that all the patients in study group are administered a fixed dose of risperidone every day. This can be done by careful selection.

But this study also has limitation, like it has been studied only on very small groups and also for very short period.

CONCLUSION

Risperidone definitely causes increase in blood sugar level. In this study this has been shown in non diabetic patients. Patients on risperidone should undergo frequent monitoring of blood sugar levels and it become essential in patients with preexisting diabetes mellitus. Glucose tolerance test should be done at regular intervals in patients who are receiving risperidone.

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