Tripolitana Medical Journal; 2024, Vol. 13, No. 2, pp. 29 - 32

Research Article
ISSN 2077-5628

Analysis of some Serum Constituents of Haloperidol Treated Patients.

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Received 10 th August 2024 / Accepted 15th Septempr 2024

ABSTRACT

Patients who receive antipsychotic drugs are more susceptible to dyslipidemia and weight gain due to the metabolic side effects of these drugs. The objective of the present study was to compare the effects of haloperidol used alone or in combination with other antipsychotic drugs on serum lipid profile.

65 admitted patients into Al-Razi Hospital for psychiatric diseases in Tripoli city of Libya were enrolled in the study. Patients were divided into two groups. One group had received haloperidol for a short-term duration (less than 12 months), and the other group, had received haloperidol for a long-term duration (more than 2 years). Both groups have been divided into two subgroups, one subgroup treated with haloperidol only and the other subgroup of patients treated with haloperidol plus other antipsychotic drugs. Serum triglycerides, total cholesterol, and fasting blood glucose (FBG) were measured in the hospital laboratory.

In this study, we could detect a significant difference between FBG in patients treated with haloperidol plus other antipsychotics for the long-term (97±17 mg/dl) and those patients treated with haloperidol plus other antipsychotics for short-term duration (88±9 mg/dl). Also, the difference in cholesterol levels between these two groups is significant (p=0.01), patients treated with haloperidol and other drugs for a long duration have higher serum cholesterol levels than patients treated with haloperidol and other drugs for a short duration. We also found a higher level of serum triglycerides in patients treated with haloperidol with other drugs for a long duration than those treated with haloperidol and other drugs for a short duration. The study found that, haloperidol is the most commonly used anti-psychiatric drug in al Razi Psychiatric Hospital in Tripoli city of Libya.

Conclusion: Antipsychotic drugs including haloperidol if used for a long duration can result in an increase of FBG and serum cholesterol and triglycerides. Therefore, the blood lipid profile of patients treated with antipsychotic drugs should be investigated periodically.

Key Wards- *Haloperidol; Antipsychotics; Cholesterol; Triglycerides; Glucose.*

INTRODUCTION

Psychiatric diseases are mental disorders characterized by chronic persistence of disease leading to long-term disability. Schizophrenia, bipolar disorder, and anxiety disorders are the most common psychiatric disease.[1] Common side effects of antipsychotic drugs include obesity, hypertriglyceridemia, and disturbance of glucose metabolism.[2] Anti-psychotic drugs can affect the blood lipid picture by inhibiting of enzyme activity of sterol catabolism leading to the accumulation of sterol and impaired insulin signaling, reducing the transport of cholesterol to the cellular components. Haloperidol drug is still a widely used medication across several countries including Libya. Haloperidol belongs to first-generation antipsychotic, and its mechanism is related to its ability to block dopamine D2 receptors in the brain which can reach the maximum effect when 72% of dopamine receptors are blocked.[3] The common side effects of Haloperidol include increased body temperature, dry mouth, sedation, weight gain, amenorrhea in females, and urinary retention due to blocking noradrenergic, cholinergic, and histaminergic receptors.[4] The features of the second and third generations over the first generation are the reduction of side effects including dyslipidemia.[5] For patients treated with antipsychotic drugs, blood lipid profiles should be periodically evaluated to prevent the risk of cardiovascular diseases. Statins can be used to reduce the risk of mortality and morbidity of CVD.[6] Due to the long-term use of antipsychotic drugs such as Haloperidol in psychiatric patients, its side effects on the metabolic activity of the body should be considered. Thus, we examined in this study cholesterol, triglycerides, and fasting glucose serum levels in psychiatric patients under treatment of haloperidol alone or with other antipsychotic drugs for short and long periods of use.

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MATERIALS AND METHODS

Data collection

A total of 65 patients at Al Razi Psychiatric Hospital in the Gergaresh region of Tripoli city of Libya. were inclyded in this study All of these patients are diagnosed with one or more psychiatric diseases that primarily involve schizophrenia and bipolar disorder. This study is conducted in the period from October 2023 to June 2024. Medical data are collected from the patient's medical file including age, gender, presence of other medical illnesses such as diabetes mellitus, and hypertension, family history of the indicated diseases, duration of these diseases, medications used by the patient, and the duration of use of each drug. The patient's ages ranged from 19 to 79 years with an average of 44 years. 71% of patients were males and 29% were female. The duration of treatment with haloperidol ranges from 1 month to 11 years. The hospital archive of medical files was very helpful for data collection on the long-term use of some drugs by certain patients and following the changes in the blood lipid profile of each.

Determination of serum Cholesterol and Triglycerides

The blood samples were centrifuged promptly (3000 g, 15 min) at room temperature. The test kit method provided by Biolab was used for the analysis of serum. Biolab reagent (REF 80106) was used to determine the total cholesterol based on a reported enzymatic method. Biolab reagent (REF 80019) was used to determine triglyceride levels based on a reported enzymatic method. The procedures given by the supplier were followed without any modifications for the determination of cholesterol and triglyceride (TG) levels. The normal range of serum TG is 35-160 mg/dl, and serum cholesterol is less than 200 mg/dl.[7,8]

Determination of fasting blood glucose

The serum samples were separated promptly from cells to prevent glycolysis by centrifugation. Biolab reagent (REF 80009) and BioLab reagent (REF 87109) were used to determine the fasting blood glucose based on a reported enzymatic method. The procedures given by the supplier were followed without any modifications for the determination of fasting blood glucose (FBG) levels.[9] The reference value for FBG is 82-115 mg/dl.

Statistical analysis

Data are transformed into a Microsoft Excel spreadsheet and analyzed using Sigma Plot Program version 2 for statistical calculation. An independent student–test was applied to calculate the significance. Med Calc program for medical statistical testing also was helpful in this study. The level of significance was set at $p < 0.05$.[10]

RESULTS

Figure 1: represents the relationship between the number of psychiatric patients and the age, in which the age is classified into 7 categories by the years and each category is divided according to the gender into male and female.

We also classified the patients under study according to the duration of treatment with haloperidol. Figure 2 represents the relationship between the number of psychiatric patients and their duration of treatment, in which the duration is classified into 2 categories, long-term (from 2 years to 13 years) and short-term (from 1 month to 12 months), and each category divided according to the gender into male and female.

It appears that 49 patients included in this study were using haloperidol for a shorter duration, while 16 patients were using haloperidol for a longer duration. However, we found that some of the patients were using other antipsychotic drugs at the same time as using haloperidol. Figure 3 represents the most commonly used anti-psychiatric drugs with haloperidol that were found in this study.

Some patients are using these drugs for a long duration

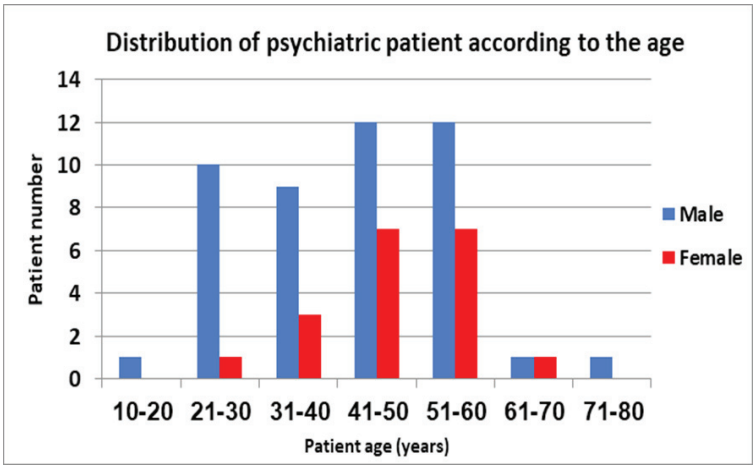

Figure 1: Distribution of patients according to the age.

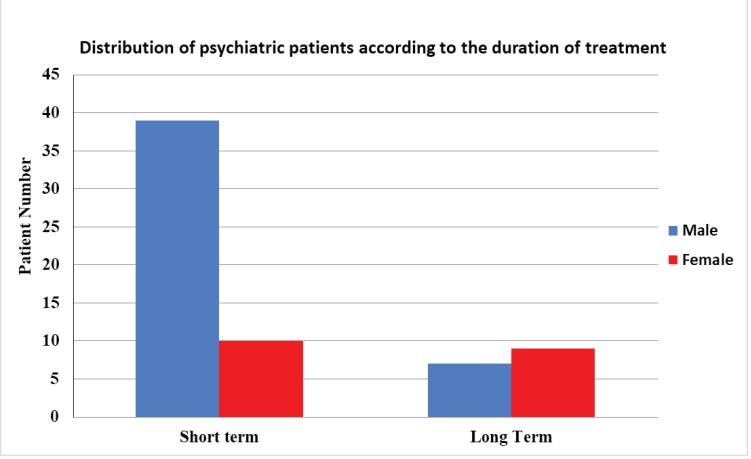

Figure 2: Distribution of patients according to the duration of treatment.

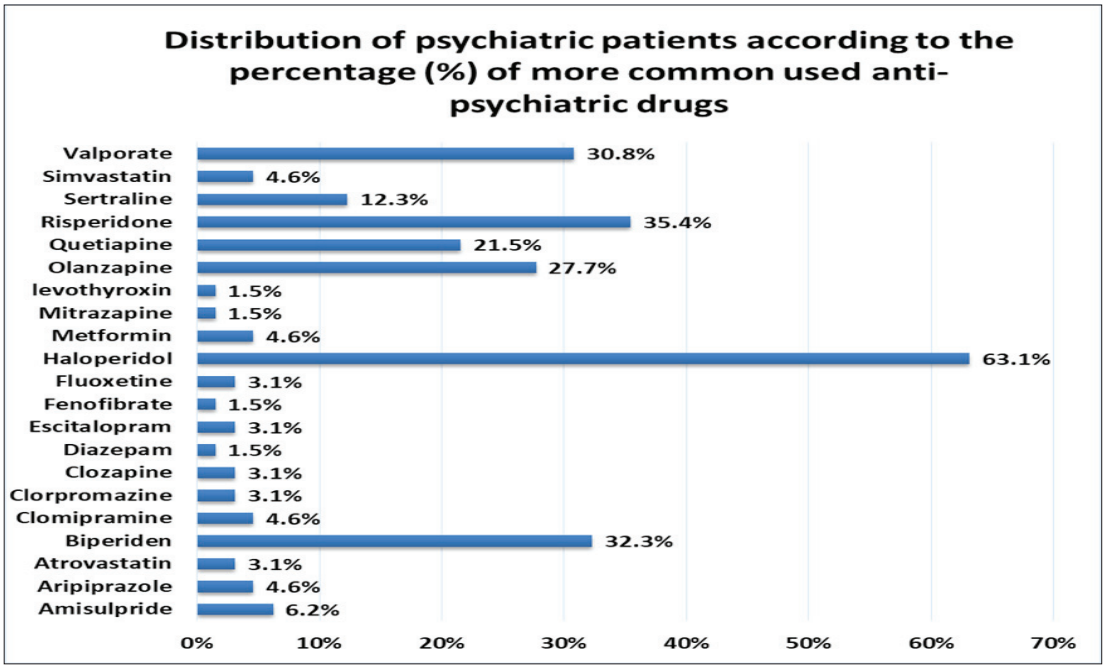

Figure 3: Haloperidol is the most commonly used drug among patients in this study.

Table 1: The mean serum levels (mg/dl) of cholesterol, Triglycerides, and fasting blood glucose (FBG) of psychiatric patients treated with haloperidol.

Treatment duration/used drug	Triglycerides± SD	cholesterol± SD	FBG± SD
Short / haloperidol	131±75	142±39	93±17
Short/haloperidol and other drugs	144±81	137±39*	88±9
Long/ haloperidol	Not found	Not found	Not found
Long /haloperidol and other drugs	182±104	164±37*	97±17*

(2-13 years) and others for a shorter duration (1 month to 12 months). In this study, we found that 27 patients out of the 65 patients included in this study were treated with haloperidol solely as an antipsychotic drug.

We also investigated the effects of haloperidol on the mean level of serum cholesterol, triglycerides, and FBG. As some patients are treated with haloperidol only without any other medications either for short or long duration, we compared these effects with that of patients who are under treatment with many antipsychotic drugs including haloperidol. We could not find patients in this study who are under treatment with only haloperidol for a period longer than 2 years. The data are collected in Table 1.

Data in Table 1 represent the mean of serum levels in mg/dl of Triglycerides, cholesterol, and FBG. of patients who are treated with haloperidol only for a short period of less than 2 years or with haloperidol and other medications for a longer duration than 2 years. Data are represented as mean ±stander deviation. The sign* indicates that there is a significant difference between this value of short duration treatment with haloperidol with other drugs and the corresponding value of long duration of haloperidol with other drugs where P=0.01 as tested by t-test of two independent samples. No significant difference is seen for the other values.

DISCUSSION

Blood lipids can be affected by many factors such as age, gender, duration of treatment with antipsychotics, family history, concurrent drug use, and FBG.[11,12] It has been also found that FBG can affect blood lipid profile in diabetic people where diabetics aged 65 years or over had a higher chance of a disturbed lipid profile than non-diabetics.[13] In this study, we could detect a significant difference between FBG in patients treated with haloperidol and other antipsychotics for long duration (97±17 mg/dl) and those patients treated with haloperidol and other drugs for short duration (88±9 mg/dl). Also, the difference in cholesterol levels between these two groups is significant (P=0.01), patients treated with haloperidol and other drugs for a long duration have higher serum cholesterol levels than patients treated with haloperidol and other drugs for a short duration. We also found a higher level of serum triglycerides in patients treated with haloperidol with other drugs for a long duration than those treated with haloperidol and other drugs for a short duration. Haloperidol drug is still widely used Antipsychotic drugs across several countries including Libya. We found that Haloperidol is the most commonly used anti-psychiatric drug in Al Razi Psychiatric Hospital in Tripoli city of Libya. Haloperidol can be used to treat diverse indications in a class of psychiatric diseases. Generally, anti-psychotic drugs can produce dyslipidemia as a metabolic side effect that increases the risk of cardiovascular diseases. The most effective method to decrease the lipid level in patients taking antipsychotic drugs is the administration of lipid-lowering agents and lifestyle change.[14] The measurements of blood lipid profiles should be done regularly for psychiatric patients to improve treatment outcomes.

CONCLUSION

Antipsychotic drugs including haloperidol if used for a long duration can result in an increase of FBG and serum cholesterol and triglycerides, so the blood lipid profile of patients treated with antipsychotic drugs should be investigated periodically.

ACKNOWLEDGEMENTS

We would like to thank the administrative and clinical staff of the Al-Razi Psychiatric Hospital in Tripoli-Libya and the laboratory of the hospital for their cooperation.

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