Assessment of the lipid profile of diabetic patients received at Dalal Jamm National Hospital

Abstract

Introduction Diabetes mellitus is a metabolic pathology characterized by chronic hyperglycemia. It is defined as fasting blood glucose ≥ 1.26 g/L (7 mmol/L) confirmed twice or blood glucose ≥ 2 g/L (11.1 mmol/L) at any time of the day. The presence of dyslipidemia affects almost 50% of diabetic patients and increases the risk of cardiovascular disease in these already high cardiovascular risk patients.

Methods: This was a retrospective, descriptive and analytical study conducted in diabetic patients followed by CHNDJ. The staff were recruited from the biochemistry department of the medical analysis laboratory between August 2019 and February 2020. The main objective was to assess the lipid profile and atherogenicity indices in these patients.

Results: The study population was 231. Average age was 56.8 ± 8.15 years (extreme: 35 and 8 1 years). The overall prevalence of dyslipidemia was 67.1%. Hypercholesterolemia was the most common anomaly (51.5%), followed by hyper-LDL-cholesterolaemia (25.1%). Dyslipidemia was significantly more common in women than in men (80.6% vs 19.4%; p = 0.004). Women were also more likely to experience hypercholesterolemia, LDL-cholesterolaemia and mixed hyperlipidemia.

Conclusion: This study shows that exploring the lipid profile is essential in diabetic patients, in order to better prevent and manage the risk of cardiovascular disease.

Keywords*: Diabetes , lipid profile, cardiovascular disease*

Introduction

Diabetes mellitus is a metabolic pathology characterized by chronic hyperglycemia and defined by fasting blood glucose greater than or equal to 1.26 g/L (7 mmol) twice or a blood glucose greater than 2 g/L (11.1 mmol) at any time of the day, with disturbances in the carbohydrate, lipid and protein metabolisms, in relation to a defect in insulin secretion and/ or effect [1].

The presence of dyslipidemia is common in diabetic patients, affecting almost 50% of these patients and aggravating the risk of cardiovascular disease in these already high cardiovascular risk patients. Typical lipid abnormalities of the type 2 diabetic patient are due to their association with low HDL-C. The control of these lipid abnormalities in diabetics is one of the primary lipid abnormalities in the prevention of cardiovascular complications.

However, these anomalies remain largely uncontrolled in these patients despite the statines treatments which mainly affect LDL-C [2]. It has been known for a very long time that the lack of insulin effect, a key hormon in lipid metabolism, causes dyslipidemia, which is an alteration in the quality and/or quantitative of the lipid balance, strongly associated with the cardiovascular risk associated with atherosclerosis. This alteration is due to the disruption of lipoprotein metabolism. Diabetes, by its chronicity, is likely to cause many complications, dyslipidemia includes among this range of complexions[2].

It is in this context that we conducted a study on the evaluation of lipid profiles of diabetic patients in the biochemistry department of the CHNDJ medical analysis laboratory between August 2019 and March 2020.

Materials and methods

This study was carried out in the biochemistry department of the national Dalal Jamm hospital in Senegal. This was a retrospective descriptive study aimed at analyzing 1^{ere} August 2019 to 1^{ere} March 2020

The collection of retrospective data entered the laboratory registry from August 2019 to March 2020. The study population was made up of patients with diabetes who had been hospitalize d or visited outside the National Dalal Jamm Hospital during this period. All diabetic patients with a lipid balance prescription and results available in the laboratory register were included. Diabetic patients not meeting the following criteria: absence of incomplete lipid balance and non-compliance with pre-analyzed conditions were not included.

Epidemiological parameters were age, sex, and diagnosis orientations . The biological parameters concerned: lipid balance (Total cholesterol, triglycerides, hDL-cholesterol and LDL-cholesterol) and glycated hemoglobin (Hb1Ac) and the latter were measured using enzyme-adapted methods on the ARCHITECT 4100 (Abbo‘ DiagnosLcs). For LDL-C, when the value of TG < 3.5g/l was calculated by the Frielwald formula, however, its direct method was used when the value of TG> 3.5g/l.

All observations were entered and encoded on Windows Excel 2016, then analyzed using SPS S software. The graphics were generated by Excel 2016. The results were presented in tables and graphs.

Results

The average age of the study population is 57.4±13.8 years with a minimum of 26 years and a maximum of 86 years. People aged 60 or over accounted for 48.5% of the study population ***(Figure 1).*** Out of a total of 231 countries included in this study series, there are 173 women and 58 men: 74.9% and 25.1% respectively, or 0.3 (M/F) ***(Figure 2)***. Glycemic imbalance was observed in 24.7% of patients ***(Figure 3).*** The mean age of the patients was 56.75±13.4 in females and 59.5±14.9 in males and females over 60 years of age was more observed in females than in males ***(Figure 4).***

Dyslipidemia was observed in 155 patients or 67.1% of the study population. Hypercholesterolemia was the most common dyslipidemia with a prevalence of 51.5% followed by hyper LDL-cholesterolaemia 25.1% (Figure 5). The association between dyslipidemia and sex showed that women had a prevalence of 63.2% vs. 36.8% for men with a statically significant difference in p=0.004. The binding between dyslipidemia, age groups and glycemic control is not statistically significant even if dyslipidemia is more observed in men and in patients with glycemic imbalance ***(Table I).***

The association between the types of dyslipidemia and sex showed that hypercholesterolemia, hyper LDL-cholesterolaemia, and mixed hyperlipidemia were observed more in women than in men with high prevalence (84.8% women vs 15.2% men p=0.001) (Table II); (83.6% women v s 16.4% men p=0.003) ***(Table III, Table IV).***

Dyslipidemia associated with age groups and glycemia control showed that patients aged 60 y ears or older and those with a glycemia imbalance were more exposed to dyslipidemia, but these did not show any statistically significant differences.

Discussion

Diabetes is an important cardiovascular risk factor, due to dyslipidemia. This dyslipidemia is characterized by changes in quality and quality which contribute strongly to the atherogenic. These changes have been the subject of several recent studies to better assess the thrombo-atherogenic risk of this population. Thus, we attempted to evaluate the lipid profile and the atherogenicity indices of diabetic patients received at CHNDJ. It was a retrospective, descriptive and analytical study carried out at the biochemistry department of the CHNDJ Medical Analysis Laboratory between August 2019 and March 2020. To carry out this study we worked on 231 diabetes patients.

The average age of the study population was 57.4±13.8 years with a minimum of 26 years and a maximum of 86 years. People aged 60 or over accounted for 48.5% of the study population.

Our results are consistent with those of the series carried out in Morocco by *Amelouk sara*[3] with an average age of 56.58±8,15 years and extremes ranging from 35 to 81 years and those made in Mali by *Oumar Sangho et al* [4] with an average age of 54.9±12 years, and extremes ranging from 31 to 85 years and a predominance of persons over 50 years of age were also noted in these studies. This predominance in the elderly could be explained by reduced physical activity and poor nutrition. The distribution of the patients by sex showed a high female predominance 74.9% women and 25.1% men i.e., a sex-ratio of (58/173= 0.3) (M/F). These results are similar to those observed in Algeria by *Salah Zaou et al* [5] and Benin by *F. Djrolo et al* [6], which showed a high female predominance respectively (64% women and 36% men) and (62. 1% women and 37.9% men). The high percentage of women with diabetes could be explained by the sedentarily of women relative to men and the high frequency of women's health structures. In our series we found that apart from diabetes considered a cardiovascular risk factor; 134 (58%) of patients had at least one other cardiovascular risk, i.e., 48.5% were over 60 years of age and 19% had HTA. These results corroborate those of AMELOUK SARA, which found that 51% of patients had at least one cardiovascular risk factor [3].

Total cholesterol averages were 2.1±0.54g/l and LDL-cholesterol 1.35±0.45g/l. They are slightly higher than usual, while the averages of triglycerides and HDL-cholesterol were normal. Th e prevalence of dyslipidemia in our study population was 67.1%. This prevalence is consistent with a study in Algeria by *N. Benabadji* [7] which found 60% dyslipidemia. In our study, hypercholesterolemia was the most common dyslipidemia with a prevalence of 51.5% followed by hyper LDL-cholesterolaemia 25.1%; The prevalence of hypertriglyceridemia (13.4%), hypo LDL-cholesterolaemia (14.1%) and mixed hyperlipidemia (10%) were lower. Our results are comparable to those of Oumar Sangho et al [4] who found a predominance of hyper cholesterolemia (39.4%) followed by hyper LDL-cholesterolaemia (24.2%), followed by hypertriglyceridemia. Other studies have found that the hyper LDL-cholesterolemia was the most common of the dyslipidemias *Doupa et al* [8], and *Cisse et al*[9]. It should also be noted that LLD-cholesterolaemia is always associated with total cholesterol. These events could be explained by the fact that our cohort is increasingly adopting a fat-rich diet with an increase in the number of fast-food restaurants.

In our study, dyslipidemia was observed more in women than in men (80.6% females vs 19.4 % males) p=0.004. The association between the types of dyslipidemia and sex showed that hypercholesterolemia, hyperLDL-cholesterolemia, and mixed hyperlipidemia were observed more in women than in men with respective (87.9% women vs. 12.1% men) (P=0.001); (83.6% women vs 16.4% men) (p=0.003) (91.3% females vs. 8.7% males) (P=0.05). These results are comparable to those obtained in Saint Louis by *L.P. Thiombiano et al*[10] and those made in Mali by Doumbia et al[11], which found results (65.4% women vs. 34.6% men) and (74% wo men vs. 26% men). These high prevalence of significant dyslipidemia in women, more specifically, hypercholesterolemia, hyperLDLaemia and mixed hyperlipidemia could be explained in part by sedentarily, poor nutrition, and socio-economic realities or most

women remain at home. Other factors include the menopause of older women who are more numerous in our study and estrogen deficiencies.

Conclusion

In conclusion our study highlights that diabetes leads to a major increase in cardiovascular risk. It is also associated with significant lipid disorders. Thus, an evaluation of the lipid profile would be important for diabetic patients, with a view to preventing and preventing effective cardiovascular disease.

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Figures and tables

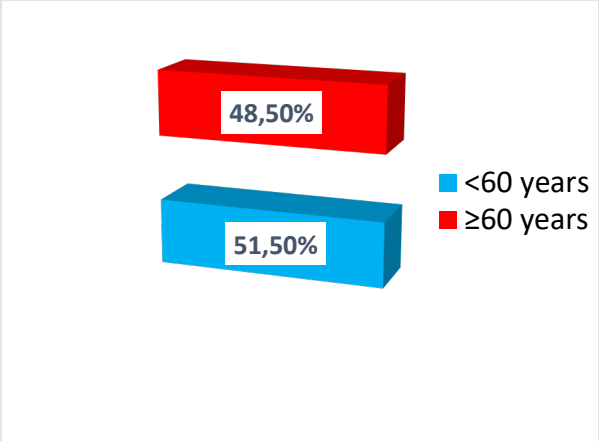

Figure1: Age distribution of patents

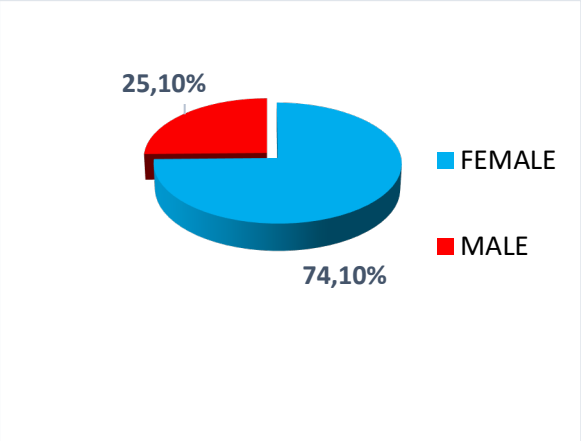

Figure2: Sex distribution of patients

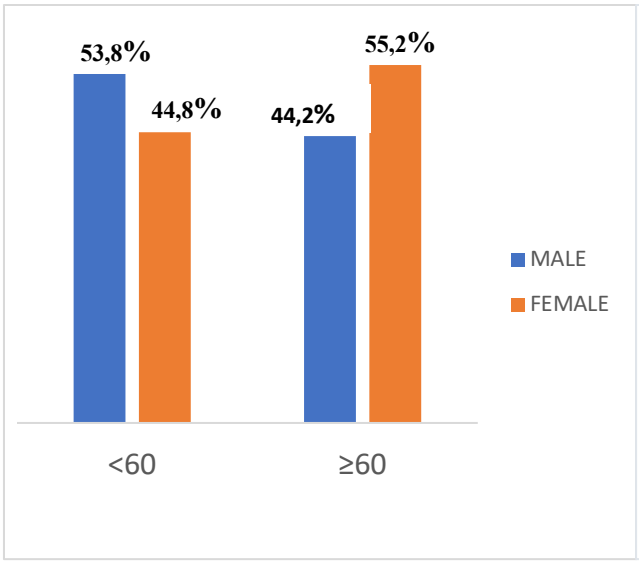

Figure 3: Distribution of patients by sex and age

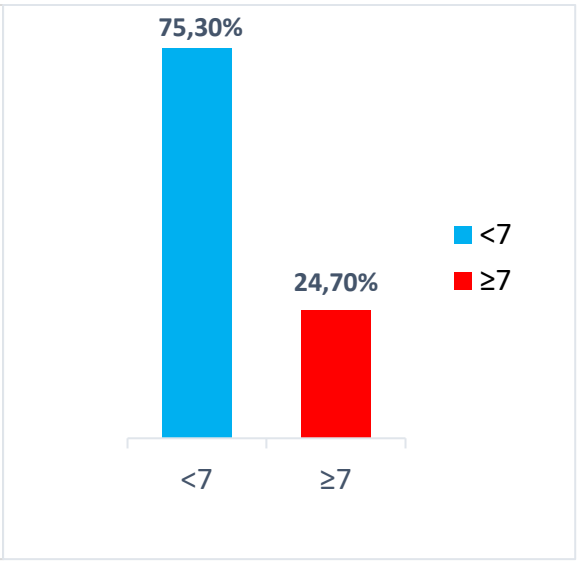

Figure 4: Distribution of patients according to glycemic control

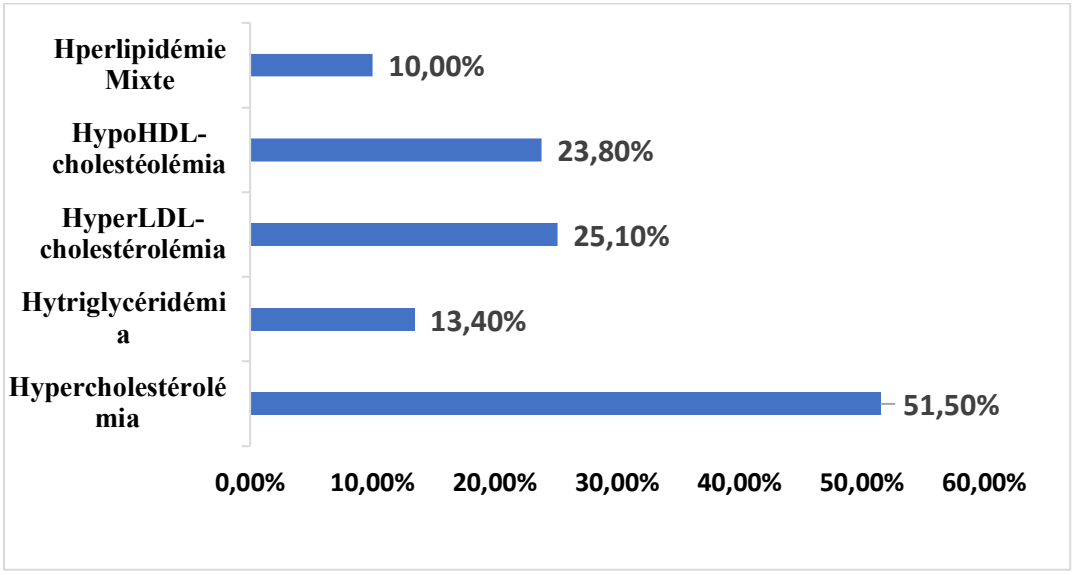

Figure 5 : Distribution of patient by type by dyslipidémia

Table I: Distribution of dyslipidémia according to age, sex, and glycemic control

Variables	Dyslipidémia		P-value
	Yes	No	
Age			
<60	55,3%	49,7%	**p=0,42**
≥60	44,7%	50,3%	
Sex			
Female	63,2%	80,6%	**p=0,004***
Male	36,8%	19,4%	
Glycémic control			
Yes	73,7%	76,1%	**p=0,35**
No	26,3%	23,9%	

Table II: Distribution of hypercholesterolemia according to age, sex, and glycemic control

Variables	Hypercholestérolémia		P-value
	Yes	No	
Age			
<60	49,6%	53,8%	**p=0,5**
≥60	50,4%	46,2%	
Sex			
Female	84,8%	63,2%	**P<0,001***
Male	15,2%	36,8%	
Glycemic control			
Yes	75,2%	75,5%	**p=0,35**
No	24,8%	24,7%	

Table III: Distribution of hyperLDL-cholestérolemia according to age, sex, and glycemic control

Variables	HyperLDL-Cholestérolémia		P-value
	Yes	No	
Age			
<60	50,9%	52,9%	
≥60	49,1%	48,1%	**p=0,86**
Sex			
Female	83,6%	66,9%	
Male	16,4%	33,1%	**p=0,003***
Glycemic control			
Yes	73,6%	76,9%	**P=0,86**
No	26,4%	23,1%	

Table IV: Distribution of dyslipidémia according to age, sex, and glycemic control

Variables	Hyperlipidémia mixte		P-value
	Yes	No	
Age			
<60	39,1%	52,9%	
≥60	60,9%	47,1%	**p=0,21**
Sex			
Female	91,3%	73,1%	**p=0,05***
Male	8,7%	26,9%	
Glycemi control			
Yes	69,6%	76%	**P=0,5**
No	30,4%	24%	