(RESEARCH ARTICLE)

Cardiovascular profile of patients with type 2 Diabetes

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Abstract

The diabetic patient is a subject at high cardiovascular risk. Accurate determination of cardiovascular risk requires reliable tools to implement preventive measures. Can risk equations, and in particular the SCORE (Systematic Coronary Risk Evaluation) equation, still be of interest in assessing the risk of the type 2 diabetic patient in the face of new methods such as the coronary calcium score?

The objective of the work is to determine the cardiovascular profile of type 2 diabetic patients through Score.

Material and methods: Observational and descriptive study involving 176 type 2 diabetic patients conducted during the month of April 2021. All of them benefited from a clinical examination, a metabolic, degenerative and cardiovascular risk calculation according to the Score.

Results: The average age is 58.7 years with extremes of 28 to 85 years. A female predominance was noted (74.4%) with a sex ratio of 0.3. The average duration of diabetes evolution is 8.84 years with extremes ranging from 1 month to 44 years. 57.1% of patients were on oral treatment, versus 36.3% on insulin and 6.5% on diabetic diet only. Glycemic imbalance exists in more than 62% (estimated by HbA1c). The other associated risk factors found are: hypertension (56%), obesity and overweight (82.1%), smoking (12%) and sedentary lifestyle (60.7%), dyslipidemia was found in 66 patients (56.5%); 89.6% of women were menopausal. Microangiopathic complications are noted in 60.7% of cases: nephropathy (38.2%), retinopathy (33.3%), neuropathy (59.8%). Macroangiopathic complications affect 23.2%. In our population, 67.3% have a very high cardiovascular risk (> 10%) according to the SCORE.

Conclusion: Type 2 diabetic patients are already at high cardiovascular risk. The seriousness of cardiovascular complications in diabetic patients reflects the importance of assessing their cardiovascular risk and of comprehensive management integrating the various risk factors. The Score remains an important and simple tool for estimating cardiovascular risk in patients with type 2 diabetes.

Keywords: Diabetes; Cardiovascular; Stratification; Risk; Score.

1. Introduction

Coronary artery disease is the leading cause of death in diabetic patients. This phenomenon is of interest to all types of diabetes and particularly to type 2 diabetics who frequently accumulate cardiovascular risk factors. The risk of cardiovascular disease is thus twice as high for patients with diabetes compared to the non-diabetic population of the same age [1]. In addition, other cardiovascular risk factors such as obesity and high blood pressure may be associated with diabetes and increase the risk of micro and macrovascular complications. Therefore, the diabetic patient is considered a potential vascular atheromatous subject [2].

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Precise determination of cardiovascular risk requires reliable tools to put in place the necessary preventive measures. The SCORE (Systematic Coronary Risk Evaluation) risk equation, although recommended and widely used, has some limitations, which is why new methods have been developed to establish patients' cardiovascular risk more precisely. These include the Coronary Calcium Score, risk markers such as ultra-sensitive CRP or homocysteine [3].

In our exercise setting, is there still interest in using Score to assess the cardiovascular risk of our type 2 diabetic patients?

2. Material and methods

This is an observational and descriptive study conducted at the department of endocrinology, diabetology, metabolic diseases and nutrition of the Mohammed VI University Hospital of Marrakech (Morocco) on 168 type 2 diabetic patients followed during the year 2021 on the 176 convened. The criteria for inclusion and exclusion are as follows:

- Inclusion Criteria: Type 2 diabetic patients admitted on a non-emergency basis (ketoacidosis, severe hypoglycemia)
- Exclusion criteria: Patients with type 1 diabetes, gestational diabetes, incomplete files.

Of the 176 patients summoned, only 168 met the criteria for our study.

2.1. Factors studied

The variables studied concern not only socio-demographic characteristics but also medical characteristics and cardiovascular risk factors such as high blood pressure, tobacco, cholesterol. The data were collected by means of a questionnaire filled in by the department doctor.

The physical examination included anthropometric measurements (weight, height, abdominal perimeter, blood pressure; it also included the monofilament test for neuropathies, measurement of the Systolic Pressure Index (SPI).

A biological assessment comprising: venous glycaemia, glycated hemoglobin (HbA1c); 24-hour microalbuminuria, creatinine, lipid assessment (Total Cholesterol, HDL cholesterol, LDL cholesterol, Triglycerides).

The determination of the cardiovascular profile of the patients was done according to SCORE. The use of the SCORE equation, which takes into account gender, age, systolic blood pressure, smoking and total cholesterol to determine the risk of death at 10 years of age.

Depending on the Score and the characteristics of the diabetes, the level of VCR is considered low, moderate, high, or very high. In the case of CV disease or diabetes associated with other risk factors, the patient is considered high risk from the outset (Figure 1).

- Risk is defined as low when SCORE<1%.
- The risk is moderate for young patients with type 1 diabetes < 35 years of age or type 2 diabetes < 50 years of age with a duration of diabetes progression < 10 years and no other risk factors. The SCORE is then between 1% and 5%.
- The risk is high: when risk factors alone are clearly elevated, in particular Total Cholesterol (TC)> 3.1g/l, LDL-C> 1.90g/l or a Blood Pressure> 180/110 mmHg. Patients with type 2 diabetes without target organ involvement with a duration of diabetes progression > 10 years and without additional risk factors. They are also patients with kidney disease with a glomerular filtration rate between 30 and 59 ml/minute. The calculated SOCRE is between 5% and 10%.
- The risk is very high: when there is documented cardiovascular disease, or diabetes with target organ involvement (retinopathy, nephropathy, neuropathy), or type 1 diabetes with a progression time > 20 years. There is also renal disease with a glomerular filtration rate < 30 ml/minute. The calculated SCORE is > 10%.

2.2. Data analysis

The data were entered and analyzed using Word, Excel and SPSS software. The statistical analyses were mainly descriptive in nature, using:

- Calculation of numbers and percentages, for qualitative variables
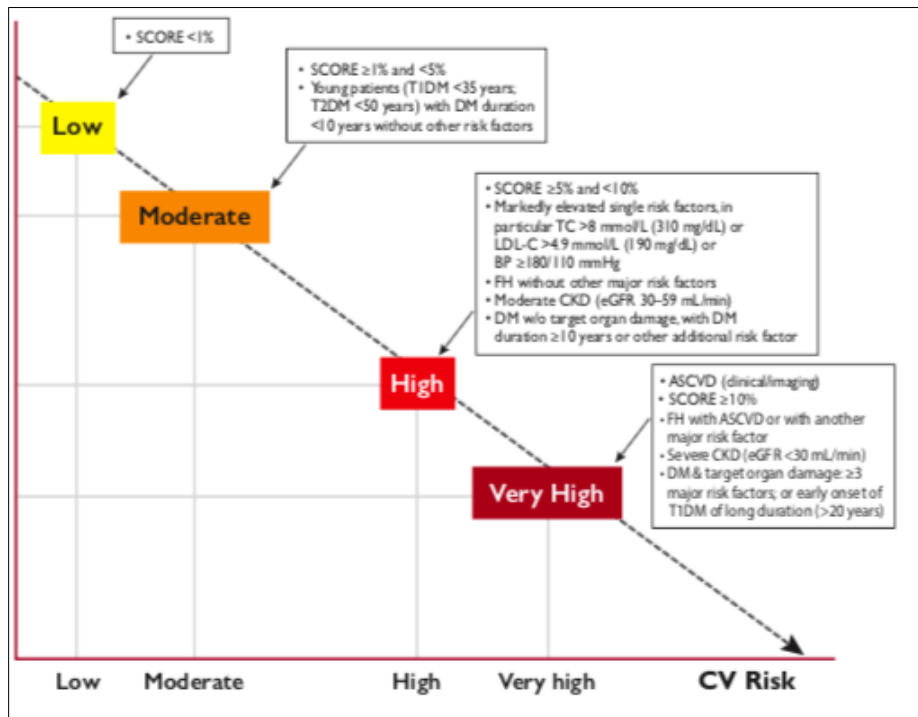
- Calculation of central tendency measurements: average

Figure 1 Cardiovascular risk categories in patients with diabetes [1].

3. Results and discussion

3.1. General characteristics of the population

The study population consisted of 168 patients with T2DM, mean age 58.7 ± 10.7 years (extremes: 28-85 years), modal class 55-64 years (Figure 2). There were 125 (74.4%) females and 43 (25.6%) males, for a sex ratio of 0.3.
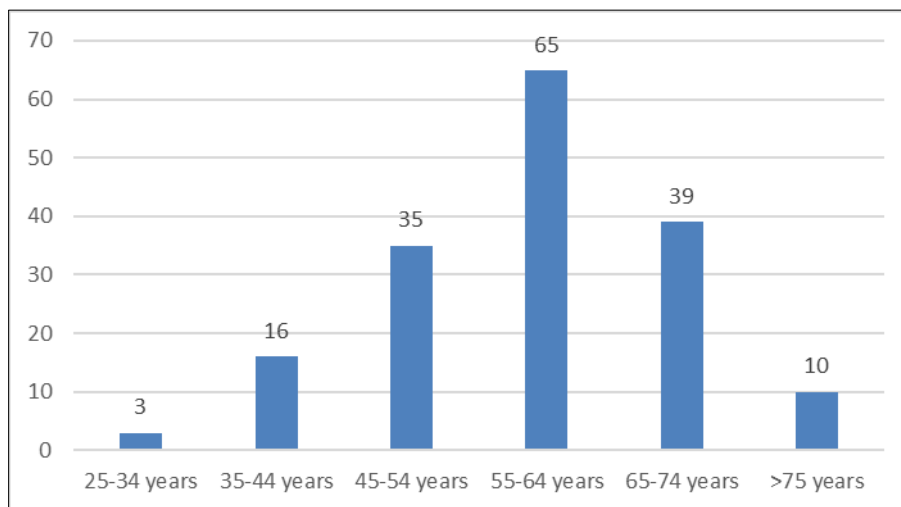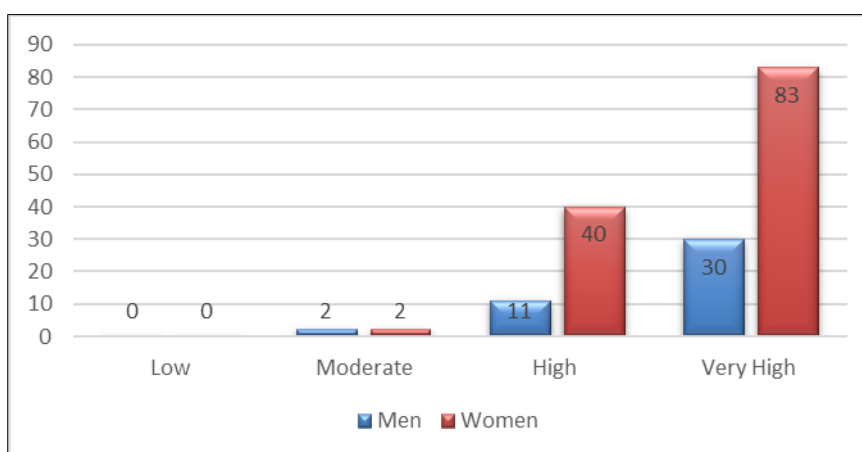

Figure 2 Distribution of patients according to age

3.2. Study of associated risk factors

The mean duration of diabetes progression was 8.92 ± 0.7 years (extremes: 1-32 years). The treatment of diabetes consisted of dietary hygiene in 11 (6.5%) patients, monotherapy with hypoglycemic sulfonamides in 11 (6.5%) patients or biguanides in 33 (19.6%) patients, oral dual therapy with hypoglycemic sulfonamides and biguanides in 52 (30.9%) patients, and insulin therapy alone or in combination with biguanides or biguanides and hypoglycemic sulfonamides in 61 (36.3%) patients. Out of 132 patients in whom control could be assessed, 63 (47.8%) had good control, 28 (21.2%) had moderate control, and 41 (31.0%) had poor control. Glycemic imbalance exists in more than 62% (judged on HbA1c). The other associated risk factors found are: hypertension (56%), obesity and overweight (82.1%), smoking (12%) and sedentary lifestyle (60.7%), dyslipidemia is found in 66 patients (56.5%); 89.6% of women were postmenopausal. Microangiopathic complications are noted in 60.7% of cases: nephropathy (38.2%), retinopathy (33.3%), neuropathy (59.8%). Macroangiopathic complications affect 23.2%.

3.3. Risk stratification

In our study population, 67.3% have a very high cardiovascular risk (> 10%) according to the Score and 30.3% have a high risk (figure 3).

Figure 3 Distribution of patients according to cardiovascular risk.

Alone or in combination with other vascular risk factors, diabetes is responsible for high morbidity and mortality worldwide [1]."The diabetic patient is a subject at high cardiovascular risk" is the conclusion of all the epidemiological work. Thus, cardiovascular (CV) events and mortality related to coronary heart disease, stroke and arterial damage of the lower limbs are significantly increased in these patients. This phenomenon concerns all types of diabetes, and particularly patients with type 2 diabetes (T2DM) who frequently accumulate cardiovascular risk factors (CVR) as found in our study where more than half, 67.3% are patients at very high cardiovascular risk due to the accumulation of risk factors.

In addition to chronic hyperglycemia, which is the basis for the definition of diabetes, hypertension (hypertension), dyslipidemia, which is specific to patients with diabetes, and smoking are the most important factors in VKR [4]. These different factors are generally found in our study population, reflecting the strong association of cardiovascular risk factors with diabetes [5].

Diabetes is accompanied by a high incidence of quantitative and qualitative lipoprotein abnormalities. Their involvement in the accelerated development of atherosclerosis, observed during diabetes as in our series, appears highly probable [6]. It is therefore essential to manage them effectively and to make diabetics aware of the benefits of treatment with a view to reducing vascular risk [7].

In our study, 89.6% of the women were menopausal. Menopause, characterized by significant hormonal changes, is a physiological period in women's lives [8]. These changes can impact the risk of cardiovascular events. Cardiovascular disease is the leading cause of death in women with diabetes, well before breast cancer, including after menopause [9]. Women with diabetes lose the cardiovascular protection traditionally conferred by their sex and have a higher relative cardiovascular risk of diabetes than men. Menopause is an important consideration in estimating cardiovascular risk in T2DM patients. Cardiovascular mortality is also increased more significantly in women than in men in the presence of

associated diabetes [10]. The cardiometabolic risk profile of women with diabetes is more impaired than that of men. Many converging studies point out that the relative over-risk of heart attack or stroke associated with diabetes is higher in women than in men compared to a non-diabetic population, suggesting that cardiovascular prevention should be optimized for women with diabetes [11].

Finally, our study also observes that the type 2 diabetic subject through Score is a subject at high cardiovascular risk and that this simple stratification, accessible and easy to use, remains current for assessing cardiovascular risk due to the different associated risk factors [12].

4. Conclusion

Patients with type 2 diabetes are already at high cardiovascular risk. The seriousness of cardiovascular complications in diabetic patients reflects the importance of assessing their cardiovascular risk and of comprehensive management that integrates the various risk factors. The Score is an important and simple tool for estimating cardiovascular risk and in type 2 diabetic patients, it allows us to understand that they are often subjects at very high cardiovascular risk.

Compliance with ethical standards

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I thank my teachers for their help in developing this work.

Conflict of interest statement

I declare no conflict of interest.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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