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Cardiovascular risk factors study in Kara university hospital cardiology department from January 1, 2022 to June 30, 2024

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Abstract
Background: Cardiovascular disease is the worldwide leading cause of death, and its incidence is directly linked to cardiovascular risk factors. Identifying these factors is the foundation of treatment.
Objective: This work aims to determine the prevalence of cardiovascular risk factors and then estimate the overall cardiovascular risk of each patient seen in the department for consultation.
Materials and methods: This was a descriptive and analytical cross-sectional study conducted in the cardiology department of the Kara University Hospital over a period of 30 months from January 1, 2022, to June 30, 2024. It took into account all patients seen in outpatient cardiology consultations who were aged 18 or over, had never previously had a cardiovascular event, and were able to complete the minimum assessment required to evaluate their overall cardiovascular risk.
Results: The sample consisted of 1,860 patients with an average age of 48.5 years and women's predominance. The most common socio-professional groups were civil servants (28.1%) and housewives (21.8%). The risk factors identified were: hypertension (51.7%), obesity (20.2%), dyslipidaemia (18.7%), triglyceridaemia (15.3%), sedentary lifestyle (7.6%), diabetes (6.8%), smoking (2.5%) and chronic renal failure (0.4%). The rate of patients with a high cardiovascular risk was 29.9% using the Framingham score and only 9.7% using the WHO score. Using the SCORE tool, the rate of patients with a high cardiovascular risk was higher in men than in women.
Conclusion: The prevalence of cardiovascular risk factors is high in our department, led by arterial hypertension. The rate of patients with a high cardiovascular risk remains high, hence the importance of raising awareness of lifestyle and eating habits in order to reduce the prevalence of these risk factors in the population.

Keywords: Cardiovascular risk factors, cardiovascular risk, Kara University Hospital, Togo

Introduction
Cardiovascular disease is now the leading cause of death in the world, according to 2021 World Heart Federation's report. Based on this report, deaths in view of these diseases have soared worldwide, from 12.1 million in 1990 to 20.5 million in 2021 [1-2]. This situation is partly due to the demographic and epidemiological transition of the 20th century, which led to a radical transformation of the morbidity and mortality picture worldwide, especially in developing countries [3-4]. Cardiovascular disease has disastrous social and economic consequences. They are responsible for absenteeism, disability and premature death, all of which contribute to a loss of productivity. They require costly treatment, which by the day increases healthcare expenditure [5]. The rise in cardiovascular disease is inexorably set to worsen as a result of new dietary and environmental behaviours and an ageing population [6-7]. The increase in cardiovascular disease is partly linked to the rise in modifiable cardiovascular risk factors such as arterial hypertension, diabetes, smoking, dyslipidaemia, obesity and a sedentary lifestyle. Individual or collective action on these cardiovascular risk factors could lead to a reduction in the incidence of cardiovascular disease [8]. This strategy of prevention of cardiovascular events is necessary and mandatory, especially in developing countries where the medical resources available for the care of the

population are limited. It was in this context of prevention that we carried out this study, the general aim of which was to assess the overall cardiovascular risk level of patients seen on an outpatient basis in the cardiology department at Kara University Hospital. More specifically, the aim was to determine the prevalence of each risk factor in the department and to analyse the influence of age and sex on these different risk factors.

Materials and methods

Study Area: Our study took place in the cardiology department of the University Hospital Centre (CHU) of Kara, which is the reference centre in the northern part of the country (Togo). Kara University Hospital has several medical departments, including the cardiology department, which treats cardiovascular diseases.

Study Method: This was a descriptive and analytical cross-sectional study of patients seen in the cardiology department of Kara University Hospital from January1, 2022 to June30, 2024, a period of thirty months.

This study took into account all outpatient cardiology consultations in the department during the study period. All patients who consulted a cardiology department during the study period and in whom no atheromatous cardiovascular event had previously been described were included in this study. Young patients under the age of 18 are not included in this study. Patients who were unable to complete the minimum paraclinical work-up to assess overall cardiovascular risk were excluded from our study.

To carry out this study, a protocol was drawn up in advance, together with a survey form for collecting the data. The aim was to include all patients seen in cardiology consultations who met our inclusion criteria. The sampling was therefore exhaustive. Once the patient has been seen by the cardiologist, he or she will record the patient's data in a medical file, which will be used to fill in the survey forms. These forms are updated as the patient returns with the results of the paraclinical work-up. The parameters we collected were: socio-demographic data (age, sex, level of education, occupation) and cardiovascular risk factors. From these data, we determined the prevalence of each cardiovascular risk factor and estimated the overall cardiovascular risk for each patient. The data were then entered into Epi info software version 7.2.6.0, which was used to process and analyse the results.

Operational definitions and RCV evaluating methods

- Hypertension is defined considering the 2018 European Society of Cardiology recommendations [10]. A patient is considered hypertensive in this study if their blood pressure is greater than or equal to 140/90 mmHg during three consecutive consultations or if they were already taking an antihypertensive medication prior to admission.
- Diabetes new cases are defined as fasting blood glucose levels above 1.26 g/l combined with above 6.5% glycated haemoglobin according to the center's laboratory standards.
- Obesity is considered to exist when a person's body mass index (BMI) is greater than or equal to 30 kg/m².
- The sedentary lifestyle was considered to be one in which people did less than three thirty-minute sessions of physical activity per week.
- We defined dyslipidaemia as the association of total hypercholesterolaemia greater than 2 g/l associated with hypoHDL cholesterolaemia less than 0.45 g/l in women and 0.40 g/l in men. Hypertriglyceridaemia was considered to be a value greater than 1.5 g/l.
- Ischaemic heart disease, cerebrovascular disease and peripheral vascular disease of the limbs were considered to be atheromatous cardiovascular events or diseases. Overall cardiovascular risk was assessed using three tools: the WHO score, the Framingham score and the SCORE (Systematic Coronary Risk Estimation) tool.
- The Framingham score took into account the following factors: age, sex, blood pressure, diabetes, and smoking, total cholesterol and HDL cholesterol. Patients were grouped into three risk categories: low-risk patients (risk < 10%), intermediate-risk patients (risk between 10 and 19%) and high-risk patients (risk ≥ 20%) [11].
- For the WHO score, the African zone diagram (AFR-D) with or without cholesterol was used. Patients were grouped into four categories: low-risk patients (risk < 10%), intermediate-risk patients (risk between 10 and 19%), high-risk patients (risk between 2 and 40) and very high-risk patients (risk ≥ 40%) [12].
- As for the score tool, it is used for patients aged between 40 and 89, with the particularity of using the SCORE2-diabetes for diabetic patients. A correction factor of 1.3 was used for all raw values to adapt to the African population. For this assessment, patients are grouped into low, moderate, high and very high risk [13].

Data processing and analysis

The data were entered, processed and analysed using Epi info software version 7.2.6.0 and Microsoft Excel version 2021. The results are presented as a proportion (frequency) for the qualitative variables and as a mean with standard deviation for the quantitative variables. The Chi-square test was used for comparison with a statistically significant test for a p-value of less than 0.05.

Results

Description of general characteristics

During our study period, we were able to include 1860 patients who met our inclusion criteria. Eight hundred and five patients (43.3%) were male, corresponding to a sex ratio of 0.76. The mean age of the patients was 48.5 ± 16.3 years, ranging from 18 to 96 years. Figure 1 shows the distribution of patients by age group, while Figure 2 shows their distribution by level of education.

The study sample consisted mainly of civil servants (public and private sector) in 28.1% of cases (521 patients). This was followed by housewives in 21.7% of cases (405 patients), shopkeepers in 17.3% (321 cases), pensioners in 10.3% (191 patients), farmers in 6.6% (123 cases), students and pupils in 6.4% (119 patients), craftsmen in 5.1% (95 cases) and other occupations in 4.5% (85 cases). Table 1 summarises the different cardiovascular risk factors identified, with a comparison between men and women. Hypertension, obesity and a sedentary lifestyle were more prevalent in women than in men, with highly significant statistical tests.

Table 2 shows the distribution of patients according to risk factors and age group. Hypertension, obesity, dyslipidaemia and a sedentary lifestyle were found in all age groups, while

diabetes, smoking, triglyceridaemia and chronic renal failure were not found in the under 25 years of age.
Table 3 compares the prevalence of different risk factors in educated and uneducated patients. Obesity and a sedentary lifestyle were more prevalent in uneducated patients, with a statistically significant difference.

Assessment of cardiovascular risk
Overall cardiovascular risk was assessed using three tools: the Framingham score, the WHO score and the SCORE tool (table 4). Low cardiovascular risk was more prevalent using the WHO score (70.2%) compared with the SCORE tool (48.5%) and the Framingham score (38.7%). The high cardiovascular risk was found to be greater using the SCORE tool (38.9%) compared with the Framingham score (29.9%) and the WHO score (9.7%), the comparison being statistically significant ($p<0.001$). Using the SCORE tool, men (43.1%) had a higher overall cardiovascular risk than women (36.2%), with a statistically significant test ($p = 0.04$).

Discussion
The aim of this study, which we carried out in a specialized cardiology department on cardiovascular risk factors, was to assess the cardiovascular risk level of patients seen in consultation, in order to establish management strategies adapted to each patient's overall risk level. However, we encountered a number of difficulties during the course of the study, in particular difficulties in carrying out biological tests, as these analyses are paid for by the patients themselves, who often have very limited financial resources. This meant that some patients were excluded from the study. Nevertheless, we were able to include a large number of patients (1,860) over a period of two and a half years, and we believe that the results will reflect the image of the department, which will enable us to adopt a new approach to patient management in the department.
The average age of the patients was 48.5 ± 16.3 years, with a predominance of women (1055 or 56.7% of the sample). This average age reflects the image of our country's population, which is young with a life expectancy below the world average. The mean age of patients in our study is almost similar to that found in most studies carried out in the sub-region, following the example of the study by Pessinaba *et al.* in Senegal in 2013 and Yahia-Berrouiguet *et al.* in Algeria in 2011, which found respectively 44 and 43 years of age [14-3]. The young age of the population in the various studies is due to the emergence among young people of cardiovascular risk factors such as arterial hypertension and diabetes, which leads them to visit health facilities for treatment. The predominance of women observed in our work is consistent with the results of most series studying cardiovascular disease risk factors. This female predominance is often explained by the association in women of several risk factors (obesity, sedentary lifestyle) and also poor eating habits, which are more marked in women. The predominance of women may also be linked to the loss of the beneficial effect of sex hormones after the menopause [15].
The most frequent risk factor in our study was arterial hypertension, found in 51.7% of cases. Hypertension is the most common chronic disease in the world, and ranks first in terms of frequency in most studies of atheromatous risk factors. Pessinaba *et al.* in Senegal and Berrouiguet *et al.* in Algeria also found hypertension to be the leading cause in 46% and 37% of cases respectively. The prevalence of hypertension was lower in these two surveys than in our own (51%) because these two surveys concerned general populations, whereas our study was carried out in hospital. In short, whether in a hospital setting or in the general population, arterial hypertension is always in first place, and this prevalence is set to increase because of new behaviour and eating habits in the population, which encourage the emergence of this risk factor, which is the main cause of cardiovascular disease [7].
Apart from arterial hypertension, other risk factors were found in lower proportions than in other studies. In our study, dyslipidaemia was found in 18.7% of cases, whereas Pessinaba *et al.* found total hypercholesterolaemia in 36% of cases [14]. This difference could be explained by the fact that the selection criteria were not the same in the two studies (we excluded from our study all patients who had already presented with proven cardiovascular disease, which certainly favoured the lower prevalence of dyslipidaemia in our study). Smoking, which is one of the major modifiable risk factors, was found to be low in our study (2.5%) compared with the results of Berrouiguet et al in Algeria, who found that 17.2% of patients smoked cigarettes [3]. The low smoking rate in our study is related to the socio-cultural considerations of our population. The hospital prevalence of diabetes was also underestimated in this study, probably because of the selection criteria, compared with the results of Tcherou *et al.* and Pio *et al.* in Togo, who reported a hospital prevalence of diabetes of 12.6% and 28% respectively [16-17]. The prevalence of obesity in our study (20.2%) is almost similar to the 23% reported by Pessinaba *et al.* in their survey [14]. This high prevalence of obesity in these studies can be explained by the westernisation of the lifestyle of black African populations, marked by sedentarisation and a diet very rich in saturated fats to the detriment of traditional diets rich in fibre and fruit [18].
Assessment of cardiovascular risk showed that 28.9% of patients had a high risk according to the Framingham model, compared with 25.5% of patients who had a high risk according to the SCORE tool. In contrast, the WHO score showed a lower rate (9.7%) of high-risk patients. In the literature, there is considerable variation in the results of cardiovascular risk assessment. This is due to the type of population chosen (general or hospital population), the selection criteria and the type of score used. In their survey on cardiovascular risk factors in the general population of the city of Saint Louis in Senegal, Pessinaba *et al.* reported that 24.9% of subjects had a high cardiovascular risk according to the Framingham score and 6.1% according to the SCORE tool [14]. In a study of 547 hypertensive patients in the Democratic Republic of Congo, Munyapara *et al.* reported that 34% had a high risk according to the Framingham score, compared with 23% who had a high risk according to the SCORE tool [19]. Higher cardiovascular risk rates have been reported by other authors in older populations combining several risk factors. This is the case of Bruckert *et al.* in France, who found that up to 72% and 77% of patients had a high cardiovascular risk according to the Framingham model and the SCORE model respectively [20]. Cardiovascular risk is generally higher in males because of cigarette abuse and also because of the protective action of female sex hormones in women of childbearing age. This trend towards a higher risk in men was observed in our

study using the SCORE model, which found 43.1% high and very high risk in men compared with 36.2% in women, with a statistically significant test (p = 0.04). Early detection and intensive management of these risk factors are essential to reduce the level of risk in our patients.

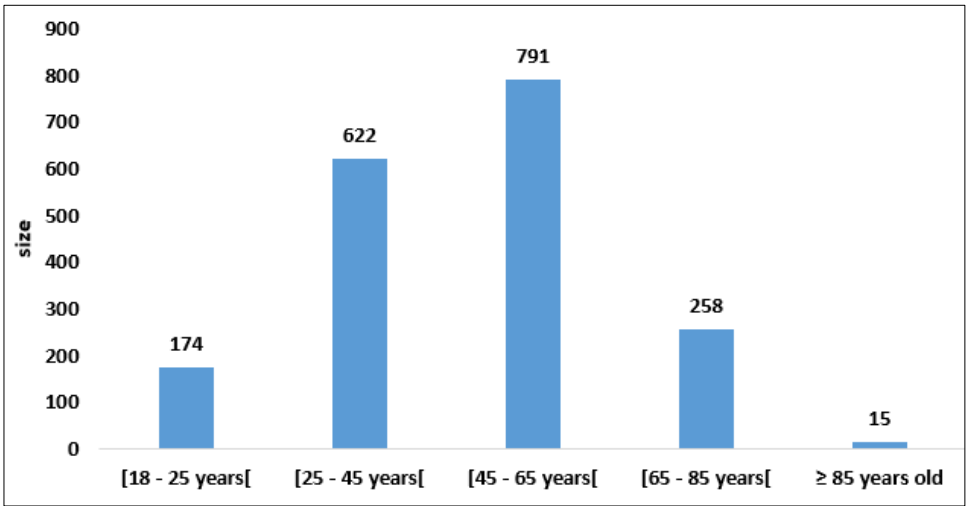

Fig 1: Breakdown of patients by age group

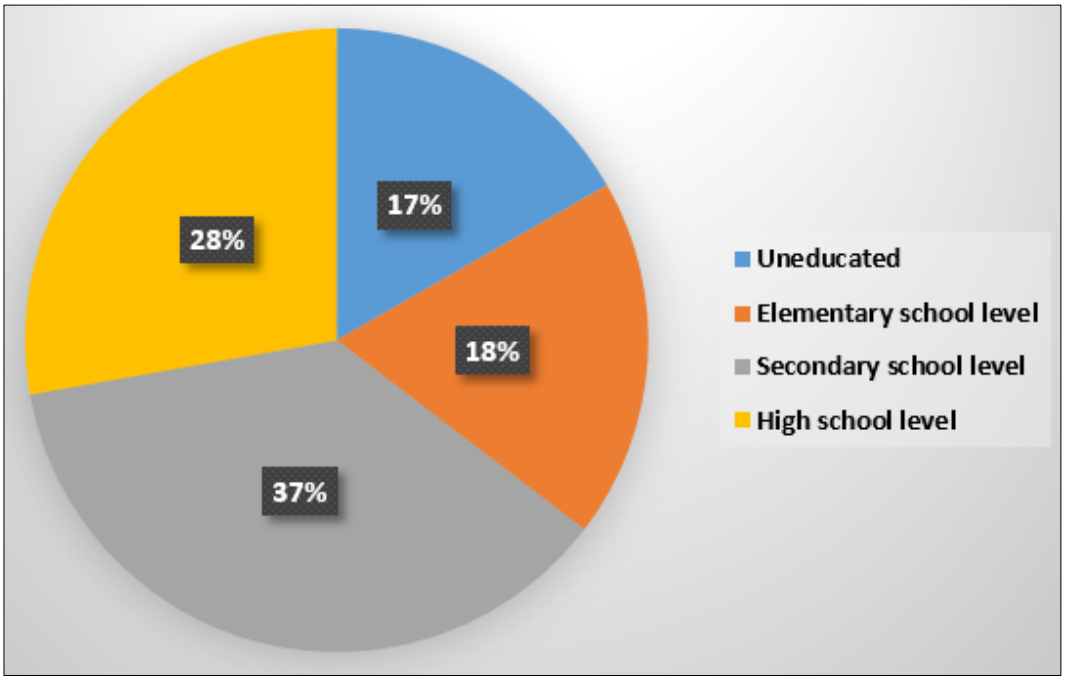

Fig 2: Breakdown of patients by level of education

Table 1: Identified different cardiovascular risk factors

	Total head count (%)	Women's number (%)	Men's number (%)	P value
HBP	962 (51,7)	598 (56,1)	364 (45,2)	< 0,0001
Obesity	377 (20,3)	302 (28,6)	75 (9,3)	< 0,0001
Dyslipidaemia	145 (18,7)	86 (17,3)	59 (20,2)	0,2
Hypertriglyceridaemia	131 (15,3)	80 (16,2)	51 (14,6)	0,43
Physical inactivity	142 (7,6)	105 (9,9)	37 (4,6)	< 0,001
Diabetes	127 (6,8)	76 (7,2)	51 (6,3)	0,46
Tobacco	47 (2,5)	7 (0,7)	40 (5)	< 0,001
CRF	7 (0,4)	5 (0,5)	2 (0,3)	0,43

HBP = High blood pressure; CRF = Chronic renal failure

Table 2: Distribution of patients according to age groups and risk factors

	< 25 years old	[25 -45[	[45-65[	[65-85[	≥ 85 years old	Total
HBP	17	272	502	160	11	962
Obesity	8	165	169	32	3	377
Dyslipidaemia	18	34	58	30	5	145
Hypertriglyceridaemia	0	43	53	30	5	131
Physical inactivity	2	31	69	34	6	142
Diabetes	0	20	74	27	6	127
Tobacco	0	15	22	8	2	47
CRF	0	1	2	2	2	7

HBP = High blood pressure; CRF = chronic renal failure

Table 3: Breakdown of patients by level of education

	Uneducated (%) (case = 316)	Educated (%) (case = 1544)	p-value
HBP	176 (55.7)	786 (50.9)	0.109
Obesity	131 (41.5)	246 (15.9)	0.018
Dyslipidaemia	32 (17.1)	113 (19.6)	0.237
Physical inactivity	37 (11.7)	105 (6.8)	0.038
Diabetes	23 (7.3)	104 (6.7)	0.142
Tobacco	4 (1.3)	43 (2.8)	0.397
CRF	1 (0.3)	6 (0.4)	0.193

HBP = High blood pressure; CRF = chronic renal failure

Table 4: The overall cardiovascular risk level's determination

	Total head count (%)	Women's number (%)	Men's number (%)	P value
WHO Score (1860 cases)				
• < 10%	1307 (70,2)	746 (70,7)	561 (69,7)	
• [10-20% [	373 (20,1)	200 (18,9)	173 (21,5)	
• [20-30% [	109 (5,9)	65 (6,2)	44 (6,2)	
• [30-40% [	36 (1,9)	20 (1,9)	16 (1,9)	
• ≥ 40%	35 (1,9)	24 (2,3)	11 (1,4)	0,4
SCORE Tool (808 cases)	392 (48.5)	257 (51.9)	135 (43.2)	0.04
• Low level	102 (12.6)	59 (11.9)	43 (13.7)	0.28
• Moderate level	216 (25.5)	119 (24.1)	87 (27.8)	
• High level	108 (13.4)	60 (12.1)	48 (15.3)	
• Very high level	301 (38.7)	185 (39)	116 (38.3)	
Framingham Score (777 cases)	244 (31.4)	156 (32.9)	88 (29.1)	
1. Low level	239 (29.9)	133 (28.1)	99 (32.6)	
2. Intermediate				
3. High level				

Risk < 10% corresponds to low risk; risk between 10 and 19% corresponds to moderate or intermediate risk; risk > 20% corresponds to high and very high risk.

Conclusion

Our study on cardiovascular risk factors in a specialized cardiology department reveals that the prevalence of these factors is high, led by arterial hypertension. Taking into account the Framingham score, the rate of patients with a high cardiovascular risk remains high in our department, hence the importance of raising awareness of lifestyle and eating habits in order to reduce the prevalence of these risk factors in the population.

Ethical considerations

Before starting the study, our protocol was approved by the Ethics Committee of the Faculty of Health Sciences at the University of Kara. In addition, an anonymity number was assigned to each patient so that the data could be treated with absolute confidentiality.

Conflict of Interest

Not available

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