Cardiovascular Risk (CV) Assessment according to the WHO Cholesterol Free Chart in the Cardiology Department of University Hospital Gabriel Touré

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ABSTRACT

Aim: Estimate Cardiovascular Risk for Patients in the Outpatient Unit in UH GT using the WHO cholesterol free chart.

Methods: A cross-sectional, descriptive and analytic study was performed from May 02 to September 02, 2016 in the UH GT outpatient unit. Involved patients were older 15 years and gave consent to participate in the study.

All patients were interviewed, underwent physical examination and labor assessment. Cardiovascular risk was evaluated using the WHO chart, without cholesterol availability, with blood glucose, sex, smoking, age, systolic blood pressure (SBP). Data were recorded in an ACCESS 2010 database, processed in MS Excel 2010 and analyzed using SPSS software version 20.

Results: 922 patients (62.9% female and 69.5% without health insurance) were seen. Risk factors in the sample were dominated by hypertension, diabetes, and physical inactivity. Patients with a risk <10% accounted for 83.4%.

Sex and age range were significantly different from the level of risk. The most common pathologies did not differ statistically significantly from the estimated risk (p = 0.998).

Conclusion: Since cholesterol dosing is not always available, a cardiovascular risk assessment using a method without cholesterol is a good alternative. Studies are needed to define the profile of patients in whom it is necessary to assess cholesterol level for the cardiovascular risk assessment.

Keywords
Cardiovascular risk factor, WHO, Bamako, Cardiology.

Introduction
Cardiovascular diseases are currently recognized as a public health problem in developing countries [1,2] and are largely due to risk factors. These various risk factors (rf) such as hypertension, diabetes, dyslipidemias, overweight/obesity, were each studied separately [3-7]. An estimate of overall cardiovascular risk taking into account both these different RDFs has rarely been done in Mali. One of the possibilities of this estimate has been proposed by WHO for its different zones [8], unlike the other proposals [9-10], based respectively on the North American and European populations.

The present study was initiated to overcome this data deficit by identifying cardiovascular risk factors and by determining the CVR levels of the patients who consulted in the cardiology department of Gabriel Touré University Hospital.

Methodology
Our sample comes from a cross-sectional, descriptive and

analytical study carried out from May 2 to September 2, 2016 in the Cardiology Department of University Hospital Gabriel Touré (UH GT) in Bamako. All patients aged 15 years and older, seen during the study period, gave consent to participate in the study.

They were asked based on a questionnary and underwent a clinical examination with noting following data:-
- Blood pressure (BP) - Weight, height to calculate Body Mass Index (BMI) according to the formula Weight (Kg)/Height (m).
- Waist circumference (WC) and Hip circumference (HC) with WC /HC ratio as waist-to-hip ration (WHR).

Complementary investigations included a biological assessment, postero-anterior chest x-ray, ECG, cardiac ultrasound and according to the pathologies other necessary examinations.

The CVR was evaluated using the WHO chart [8], without cholesterol availability, considering glycemia, sex, smoking, age, systolic blood pressure (SBP). The data were entered on an ACCESS 2010 database, previously processed by MS Excel 2010 and analyzed using SPSS version 20 software.

Results
During the study period 922 patients including 62.9% of female subjects and 69.5% without medical insurance were seen. Other socio-demographic characteristics are summarized in Table 1.

Characteristics	Effectif (%)
Not insured	641 (69,5)
Female sex	580 (62,9)
Bambara ethny	290 (31,5)
Working	847 (91,9)
Informal profession	625 (67,7)
Living in Bamako	631 (68,4)
Intra-hospital reference	315 (34,2)
Coming from house	402 (43,8)
No school attending	538 (58,4)

Table 2: characteristics of the sample of 922 patients.

Patients with a personal history of cardiomyopathy and stroke among male parents were the most represented (Table 2).

Type of history		N (%)	
		Female	Male
Personal	Sickle cell anemia	02 (0,3)	1 (0,3)
	Asthma bronchiale	04 (0,7)	5(1,5)
	Acute rheumatic arthritis	09 (1,6)	01 (0,3)
	Valvular disease	07 (1,2)	2 (0,6)
	Cardiomyopathie	48 (8,3)	31 (9,1)
	Acute coronary syndrom	02 (0,3)	02 (0,6)
	Tuberculosis	01 (0,2)	03 (0,9)
	Anemia	06(1,0)	04 (1,2)
	Non cardiac surgery	169 (29,1)	107 (31,3)

Family			
	Acute coronary syndrom male	06 (1,0)	7 (2,0)
	Acute coronary syndrom female	06 (1,0)	03 (0,9)
	Stroke male*	06 (1,0)	20 (05,8)
	Stroke female**	17 (2,9)	02 (0,6)

Table 2: distribution of past medical facts of the sample of 922 patients. **p<0,0001 *p= 0,015.

The different Rf found in the sample were dominated by hypertension, diabetes and sedentary lifestyle. Smoking, alcohol consumption were significantly higher in the male sex, while BMI-based obesity, WC-obesity, and WHR-obesity were found in females (Table 3). The anthropometric and physical variables grouped in Table 4 showed statistically significant differences between men and women for age, weight, height, BMI, WC, HC, WHR, and SBP (Table 4).

characteristics	N (%)		p
	Female	Male	
Tobacco smoking	16 (2,8)	73 (21,3)	<0,0001
Hypetension	401 (69,1)	250 (73,1)	NS
Diabetes mellitus	95 (16,43)	46 (13,5)	NS
Dyslipidemia	28 (04,8)	9 (2,6)	NS
Alcohol consumption	0 (0)	9 (2,6)	<0,0001
Sedentary lifestyle	164 (28,3)	70 (20,5)	0,008
Use of Oral Contraceptiva	69 (07,5)	0	<0,0001
Use ofdermocorticoids	55 (06)	0	<0,0001
HIV	08 (1,4)	1 (0,3)	NS
Obesity (BMI)	139 (24,0)	18 (5,3)	<0,0001
Obesity grad III (BMI)	25 (4,3)	4 (1,2)	<0,0001
Obesity (WC)	294 (54,7)	35 (11,6)	<0,0001
Obesity (WHR)	354 (61,0)	53 (15,5)	<0,0001
Anomalous pulsed pressure	122 (21,0)	88 (25,7)	NS

Table 3: distribution of cardiovascular risk factor in the sample of 922 outpatients in the cardiology department.

Variables	N	Female	Male	p
Age	918	51,25	58,55	<0,0001
Weight (Kg)	862	69,72	67,45	<0,0001
Height (cm)	850	161,50	170,14	<0,0001
BMI	850	26,65	23,12	<0,0001
WC	840	90,06	86,15	<0,0001
HC	671	99,28	91,01	<0,0001
WHR	681	0,91	0,94	<0,0001
Heart rate	797	85,43	83,68	0,176
Systolic blood pressure	918	137,29	141,16	0,041
Diastolic blood pressure	918	86,13	87,66	0,146
Pulsed pressure	918	51,15	53,50	0,060

Table 4: Description of anthropometrics and physical variables of the sample.

Patients with a risk <10% were the most represented in the sample with 83.4% followed by 10 ± 20% (Diagram 1).
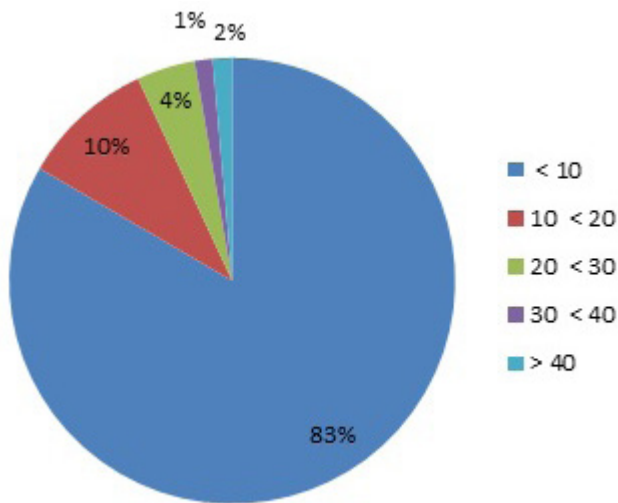
Diagram 1: Distribution of risk level in the sample of 922 patients

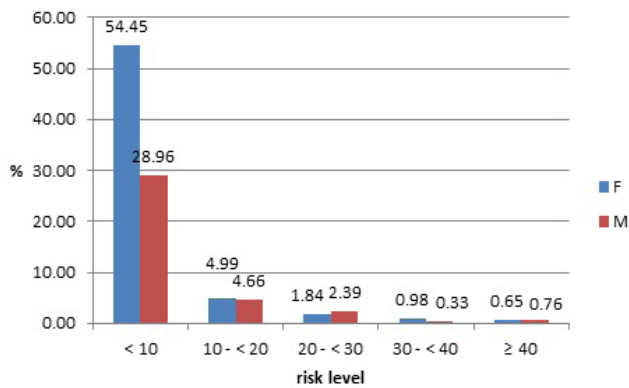Sex and age group differed significantly in the level of risk (Diagram 2 and 3).

Diagram 2: Distribution of risk level according to sex.

High risk levels (≥ 40) were more prevalent among men (Diagram 2). In both sexes the low risk (<10%) prevailed, the higher risks were found in the age group 60-74 years and more marked in men than in women (Diagram 3).
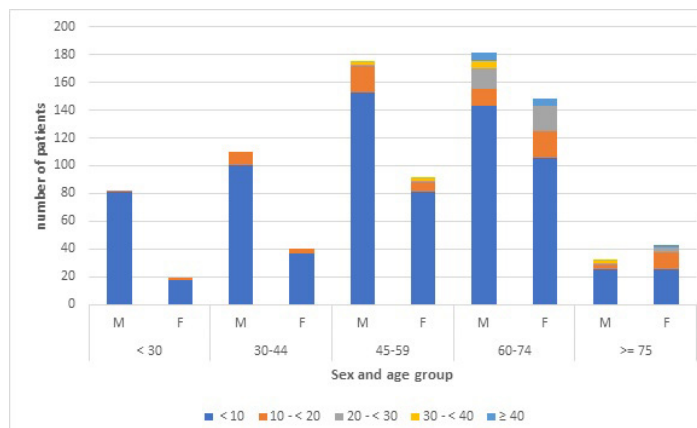

Diagram 3: Distribution of risk level according to age group and sex.

The most common pathologies did not differ statistically

significantly from the estimated risk (p = 0.998) (Table 5).

Pathologies	Risk level				
	< 10	10 ± 20	20 ± 30	30 ± 40	≥ 40
Cardiomyopathie	90.7%	5.7%	2.1%	0.0%	1.4%
HTA complicated	73.8%	15.1%	4.8%	4.0%	2.4%
HTA isolated	79.0%	12.2%	5.6%	1.5%	1.7%
Acute coronary syndrome	87.5%	8.3%	4.2%	0.0%	0.0%
VTE* disease	100.0%	0.0%	0.0%	0.0%	0.0%
Valvular disease	96.6%	0.0%	3.4%	0.0%	0.0%

Table 5: Distribution of risk level related to main pathologies. * venous thrombo-embolic.

Discussion

Our study is the first, as far as we know, in Mali to use WHO diagrams on such a wide sample to estimate CVR in outpatients seen in cardiology department, all patients having accepted to participate in the study. In the literature a similar study conducted by Munyapara [11] was performed but only in hypertensive patients.

Our study elicits some comments, taking into account the lack of similar studies in the subregion and in Africa. We also know that there are discrepancies between the different strategies [12]. The characteristics of the sample are consistent with the structure of the Malian population. It is especially important to note one third of insured patients, which is new in our context, since it considerably reduces the financial contribution of the patient.

Personal history except for non-cardiac surgery was less frequent and did not differ significantly between men and women. The exception is made by the occurrence of stroke in the family affecting men or women and which could be related to the genetic aspect of these conditions [13-16].

Of all the cardiovascular Rf found, hypertension is by far the most important, followed by sedentary lifestyle, diabetes and obesity. Although we have not found a statistically significant difference, these Rf are found in different proportions in previous studies in Mali and elsewhere [6,7,17-19].

Based on the WHO charts, 83.4% of our subjects had a risk of less than 10%. The study of the distribution of this level of risk revealed the following aspects.

Risk according to sex

In general, we had few high-risk patients in both men and women (Diagram 1). In our sample, the traditional rf such as Diabetes, Dyslipidemia, sedentary lifestyle and obesity, whether based on BMI, WC or WHR are very widely found in women. Our results are similar to those found by Kodaman et al. in Ghana [20] and Tanzania [21].

Several studies [22-24] have described the increase in cardiovascular risk in women after menopause. This contrasts with the lower

risk levels we found. We believe that the risk is underestimated because of the high prevalence of these factors as specified in the WHO document [8]. Perhaps a risk study using other models could help to find the situation described in the literature.

Risk according to age
Overall, low risk was prevalent in all age groups, and men and women reported the same pattern with the onset of significant risk beyond age 60, according to literature data [25] and a reduction in Rf for very advanced ages [26].

Risk according to the pathologies
We did not find any significant differences between the encountered pathologies and the risk level. But the low risk prevailed. The pathologies with the highest risks were complicated hypertension, acute coronary syndrom and cardiomyopathy. Regarding hypertensives Munyapara [11] found nearly 20% of patients at high risk contrary to our results.

Limits
Our work was based on the assessment of cardiovascular risk without cholesterol, according to WHO guidelines. This could lead to an underestimation of the real risk given the place occupied by dyslipidemias in the atheromatous process. Studies that take cholesterol into account are needed to compare and find patients who need cholesterol determination as in our context lipid determination is expensive.

Conclusion
The assessment of cardiovascular risk need further in deep-study, in particular by conducting studies with a complete biological assessment to quantify all the risk factors and to have a better approximation of this risk. The cholesterol determination is not always available, the method of determining cardiovascular risk without cholesterol is a good alternative. Studies are needed especially to define the profile of patients in whom it is imperative to measure cholesterol for a better estimate.

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