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Evaluation of general practitioners' knowledge on the management of arterial hypertension in the provinces of Chad

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Abstract
Introduction: Arterial hypertension (HTN) is a public health problem. In the provinces, general practitioners play a key role in managing this condition. Our objective was to assess their knowledge of HTN in order to contribute to an effective improvement in its management. Methodology: This was a prospective cross-sectional study conducted over a period of 3 months in six (06) health provinces of Chad. Physicians who gave consent and were present at their post during the survey were included. The data were analyzed using the SPSS 26 statistical software.
Results: A total of 82 general practitioners were included in our study out of the 119 present at their post, representing a participation rate of 68.9%. The average age was 36.77 ± 6.08 years, ranging from 27 to 68 years. The male sex was predominantly represented at 75.6% (n = 62) with a sex ratio of 3.1. Twenty percent of general practitioners did not know the threshold values defining hypertension. The classification of hypertension according to the WHO was not known by 24% (n = 20), nor were the cardiovascular risk factors known by 20% (n = 16). More than half, 65% (n = 53), were unable to cite all the necessary systematic paraclinical tests for a hypertensive patient. Monotherapy was initiated as first-line treatment regardless of the grade of hypertension, and the most commonly used antihypertensive therapeutic classes were calcium channel blockers and thiazide diuretics, at 32.47% (n = 24) and 28.57% (n = 22), respectively.). Therapeutic combinations were not well known by 32% (n=26) of doctors. Almost all, 96.3% (n=79), wished to participate in training on arterial hypertension.
Conclusion: Our study made it possible to assess the knowledge of general practitioners in the provinces on the management of hypertension, which is not very satisfactory.

Keywords: Hypertension, General practitioner, Knowledge, Chad

Introduction
Hypertension is a public health problem due to its serious complications and its often high prevalence worldwide. According to the WHO, it is estimated that more than 1.28 billion people were suffering from hypertension worldwide in 2021. Two-thirds of people with hypertension live in low- and middle-income countries, with higher prevalences in African regions (1). In Chad, its prevalence is estimated at 34.2% among women and 33.1% among men (2). Late diagnosis and difficulties in management in a context of limited resources are associated with early and severe complications (3). The general practitioner plays an important role in the management of hypertensive patients (4). In provincial hospitals in Chad, they are key players in the diagnosis, treatment, and follow-up of these hypertensive patients. Thus, we set ourselves the goal of objective of assessing their knowledge on hypertension, in order to contribute to an effective improvement in its management in rural Chad, already heavily affected by other diseases, especially infectious ones.

Methodology
Study design and frameworkThis was a prospective cross-sectional study conducted over a period of 3 months, from August 1 to October 31, 2023. Our study took place in six (06) health provinces of Chad, selected based on accessibility criteria, in a context of limited logistical resources. The chosen provincial hospitals were those of Massakory (Hadjer-Lamis); Mongo (Guéra); Abéché (Ouaddaï); Bongor (Mayo-Kébbi Est); Laï (Tandjilé); and Moundou (Logone Occidental).

All these hospitals have basic services enabling them to provide general medical care, gynecology-obstetrics, pediatrics, surgery, and, rarely, cardiology. Study population Our study concerned all general practitioners in the six (06) chosen provinces. Those who consented and were present at their workplace when the investigator visited were included. We conducted an exhaustive type of sampling.

Data collection. We collected our data using anonymous questionnaires, which were pre-tested on 10 doctors to resolve any ambiguities, and then these questionnaires were administered to the various general practitioners at the 06 provincial hospitals who were present, in the form of multiple-choice questions (MCQs).

Studied variables were: Socio-demographic data (Age, Gender, Years of practice), general knowledge about hypertension (Measurement conditions, Definition of hypertension, Diagnostic criteria, Hypertension classification, Basic assessment for a case of hypertension, Severity criteria of hypertension), therapeutic management of hypertension (Lifestyle and dietary measures, First-line therapeutic strategies adopted, First-line antihypertensive medications used, Therapeutic goals). Data analysis techniques and tools

Our data were analyzed using the statistical software SPSS 26. Qualitative variables were expressed as percentages and quantitative variables as mean ± standard deviation.

Ethical Considerations We obtained authorization from the health delegates of the selected provinces, as well as consent from the general practitioners. No participant identities were requested, thus ensuring their anonymity and confidentiality.

Results

A total of 82 general practitioners were included in our study out of the 119 present at their posts, representing a participation rate of 68.9%. The average age of our general practitioners was 36.77 ± 6.08 years, with extremes ranging from 27 to 68 years. Males were predominantly represented at 75.6% (n = 62), with a sex ratio of 3.1. The average length of practice in medicine was 5.61 ± 5.67 years, ranging from 1 to 32 years.

Depending on the provinces, we included 12 doctors in Hadjer Lamis, 14 in Guera, 21 in Ouaddaï, 8 in Tandjilé, 14 in Mayo Kebi Est, and 13 in Logone Occidental (Figure 1). 20% of general practitioners did not know the threshold values defining high blood pressure in the consultation office. However, home self-measurement limits were known by only 34.1% (n=28). Proper blood pressure measurement procedures were not followed by 46% (n=38). The classification of hypertension according to WHO was unknown to 24% (n=20) of doctors, as were other cardiovascular risk factors to 20% (n=16). Type 2 diabetes, tobacco use, and obesity were the most frequently mentioned factors, at 90.2% (n=74), 93.9% (n=77), and 96.34% (n=79), respectively. More than half of the doctors surveyed, 65% (n=53), were unable to cite all the systematic paraclinical tests required for a patient.

Newly diagnosed hypertensive patient. Those who had a good knowledge of the criteria for the severity of hypertension represented 40.24% (n=33). Monotherapy was initiated as the first-line treatment regardless of the grade of hypertension, and the most commonly used classes of antihypertensive drugs were calcium channel blockers and thiazide diuretics, at 32.47% (n=24) and 28.57% (n=22), respectively. Therapeutic combinations were not well known by 32% (n=26) of doctors. Hygienic-dietary measures recommended for all hypertensive patients were fairly well known by the general practitioners surveyed, 80.5% (n=66), see Table 1. Almost all, 96.3% (n=79), wished to participate in training on hypertension.

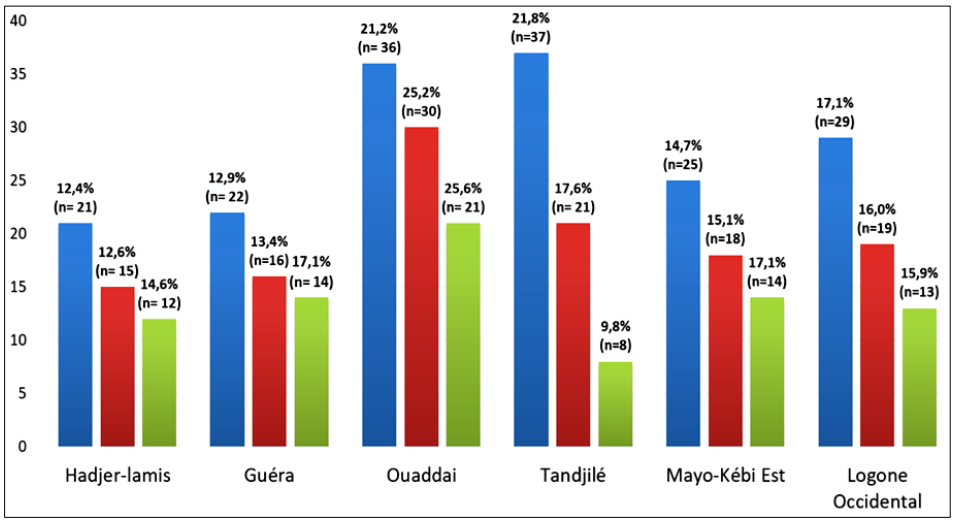

Fig 1: Total of Physician

Table 1: Questionnaires given to general practitioners and the expected responses

Questions	Expecting answer	Good Answer	Bad Answer
What is the threshold value defining hypertension in the doctor's office?	SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg	65(80%)	17(20%)
What are the proper methods for measuring blood pressure?	Subject at rest for at least 5 minutes, sitting or lying down, with an appropriately sized cuff at heart level, away from tobacco, caffeine, alcohol, and physical exertion, in a quiet place	44(54%)	38(46%)
What is the classification of hypertension (WHO and ESC)?	* Optimal BP: SBP < 120 mmHg and DBP < 80 mmHg; * Normal BP: SBP 120-129 mmHg and DBP 80-84 mmHg; * High-normal BP: SBP 130-139 mmHg and DBP 85-89 mmHg; * Hypertension Grade I: SBP 140-159 mmHg and/or DBP 90-99 mmHg; * Hypertension Grade II: SBP 160-179 mmHg and/or DBP 100-109 mmHg; * Hypertension Grade III: SBP ≥ 180 mmHg and/or DBP ≥ 110 mmHg; * Isolated systolic hypertension: SBP ≥ 140 mmHg and DBP < 90 mmHg	63(76%)	19(24%)
What are the other cardiovascular risk factors?	Age, sex, family history of stroke/myocardial infarction (MI) at an early age or sudden death Smoking, diabetes, dyslipidemia, sedentary lifestyle, obesity	62(74%)	20(26%)
What is the minimum assessment to carry out after the diagnosis of hypertension?	- Fasting blood sugar, - Creatinine, - Hemoglobin level, - Cholesterol (total, HDL), - Triglycerides, - Uric acid - Proteinuria, hematuria - Electrocardiogram	29(35%)	53(65%)
What hygienic and dietary measures should be recommended to patients with hypertension?	- Sodium restriction; - Quitting smoking; - Moderation of alcohol consumption; - Weight reduction; - Regular physical exercise	66(80%)	16(20%)
What are the different classes of antihypertensives prescribed as monotherapy?	- Thiazide diuretics - Calcium channel blockers - Angiotensin-converting enzyme inhibitors (ACE inhibitors) - Angiotensin II receptor antagonists (ARBs) - Beta-blockers	71(86%)	11(14%)

Discussion

This study allowed us to assess the level of knowledge and practice of general practitioners regarding the management of arterial hypertension in our provinces, despite the fact that they are overwhelmed by infectious diseases. Since the sampling was not done randomly and we were only able to reach 6 provinces out of the 23 in Chad, this may prevent the generalization of our results to all provinces. 20% of general practitioners did not know the threshold values defining arterial hypertension. The same observation was made in western Cameroon, where incorrect values were used by 36.4% of general practitioners to define hypertension [5].

Houenassi *et al*. in Benin found that nearly half of general practitioners (48.8%) did not know the exact definition of hypertension, and 14 (34.1%) could not provide the systolic blood pressure (SBP) and diastolic blood pressure thresholds defining hypertension [6]. This situation is not unique to Africa. Rehman *et al*. in Pakistan [7], Chen *et al*. in China [8] had made the same observation. The conditions for a proper blood pressure measurement were not met by 46% of our doctors. Ale O *et al*. in Nigeria [9] found that a small proportion of doctors, 26.4%, observed at least a 5-minute rest before taking blood pressure, and only 16.2% took BP on both arms during the first consultation. By initially measuring blood pressure in only one arm, general practitioners risk missing signs of secondary hypertension. Hypertensive patients may be mistakenly considered normotensive, and uncontrolled hypertension may be perceived as managed due to the inadvertent use of the arm with the lower blood pressure. Failing to identify the arm with the highest blood pressure and using it as a reference likely contributes to the high prevalence of undiagnosed hypertension, uncontrolled hypertension, and hypertension-related target organ damage [10, 11, 12]. A minimal assessment is recommended by the WHO after the diagnosis of hypertension. It allows for the investigation of other risk factors associated with hypertension, the detection of signs suggestive of secondary hypertension, and the identification of target organ damage [13, 14, 15]. In our context, only 35% were able to complete all the required assessments. This observation was also made by Houenassi *et al*., who found low concordance in the requested assessments. Among the 80% of general practitioners who requested this minimum set of assessments, it was only partially met in 24.4% of cases. Therapeutically, lifestyle and dietary measures (LDM) were known by the majority, 80%. The same proportion was found by Noubiap *et al*., with 77.9% [5], but

somewhat lower according to Parker *et al*., with 50% [16]. According to Chen *et al*. [8], four main problems hindered general practitioners from prescribing LDM: poor patient adherence, lack of consultation time to devote to education on LDM, insufficient physician knowledge regarding LDM, and lack of techniques to teach these LDM. The classes of antihypertensive drugs most prescribed as monotherapy in our context are calcium channel blockers and thiazide diuretics, at 32.4% and 28.5%, respectively. In Morocco, the most prescribed molecules are represented by calcium channel blockers (CCBs) (45%), followed by angiotensin-converting enzyme inhibitors (ACEIs) (26%), angiotensin receptor blockers (ARBs) (23%), and diuretics (14%) [17]. Currently, the classes of antihypertensives recommended as first-line therapy by scientific societies remain thiazide diuretics, calcium channel blockers, ACE inhibitors, angiotensin II receptor antagonists, and beta-blockers [18]. Monotherapy is prescribed regardless of the grade of hypertension, due to the fact that fixed-dose combinations are often not available in provincial areas and are poorly known by general practitioners. All had expressed the need for ongoing training on hypertension, which will help increase their level of knowledge and improve patient care.

Conclusion

Our study allowed us to assess the knowledge of general practitioners in the provinces regarding the management of hypertension, which is not very satisfactory. There is a need to organize continuous training on hypertension in order to better diagnose, treat, and monitor hypertensive patients.

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