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The influence of body weight on the development of hypertension and its complications: A study of the Wangata General Hospital and Mbandaka University Hospital

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Abstract

This study examines the influence of body weight status on the occurrence of hypertension (HTN) and its complications in patients treated at the Wangata General Hospital and the Mbandaka University Hospital in the Democratic Republic of the Congo. Hypertension is a major public health problem worldwide due to its high prevalence and serious cardiovascular, renal and neurological complications. The rise in overweight and obesity, driven by changes in lifestyle, contributes significantly to this situation. The study, which is descriptive and analytical with a quantitative approach, was conducted between January and December 2024. Of the 541 patients seen, 183 with hypertension were included. Data were collected from medical records and analysed using SPSS and Excel software. The results show a predominance of female patients (57.4%) and a high proportion of patients aged 45 to 59 years (37.2%). The majority of patients were overweight, with 35.5% being overweight and 31.7% obese. Moderate hypertension was the most common form (38.8%). The main complications observed were strokes (25.1%), followed by heart failure and kidney damage. Statistical analyses showed a significant association between a high body mass index (BMI) and the occurrence of complications. Obese patients had an approximately threefold higher risk of complications compared with patients of normal weight. The study concludes that body weight status is a determining factor in the onset and progression of hypertension. It recommends strengthening prevention, early screening, health education and the promotion of healthy lifestyles in order to reduce morbidity associated with hypertension.

Keywords: Influence, body weight status, hypertension, Body Mass Index (BMI).

I. Introduction

High blood pressure is now a major global public health problem. (1) It is recognised as one of the main risk factors for cardiovascular disease, which is a significant cause of mortality and morbidity in both developed and developing countries. According to several studies, the increase in the prevalence of hypertension is linked to lifestyle changes, notably an unbalanced diet, a sedentary lifestyle and rising levels of overweight and obesity.(1) High blood pressure (HBP) affects more than a billion people worldwide, representing over a quarter of the global population, with a

prevalence of 26.5% in 2000; this figure is projected to reach 29% by 2025, according to a team of American and British researchers. In Africa, the proportion of people suffering from hypertension is estimated to have risen from 28% to 40% over 10 years, and epidemiological projections suggest there will be 150 million people with hypertension by 2025.(1) In the Democratic Republic of the Congo, high blood pressure poses a significant public health challenge.(2) In hospital settings, particularly at the Wangata General Referral Hospital (HGR) and the Mbandaka University Hospital (CHU), cases of hypertension and its complications are becoming increasingly common.(2) These complications include strokes, heart failure, kidney damage and other serious conditions.(2) Despite the significance of this issue, few local studies have thoroughly analysed the influence of body weight on the onset of hypertension and its complications.(2) A better understanding of this relationship would help to strengthen prevention, screening and management strategies tailored to the local context.(2) It is within this context that the present study is situated, aiming to analyse the influence of body weight status on the occurrence of hypertension and its complications within the Wangata General Hospital and the Mbandaka University Hospital.(2) is not spared by this scourge. In the general population of Kisangani, the prevalence rose from 14.2% in 1992 to 28.3% in 2014. (2)

A link between hypertension and work has been demonstrated in several studies. Indeed, some authors report high prevalence rates of hypertension among workers in Africa and in industrialised countries. (2) Occupational activity has a significant impact on the onset of hypertension, through its psychosocial and environmental components that are detrimental to the worker. Unfortunately, relevant data is almost non-existent in the textile industry.

Body mass index (BMI), which reflects the relationship between an individual's weight and height, plays a key role in the development of many conditions, including high blood pressure. Indeed, being overweight is associated with pathophysiological changes such as increased peripheral vascular resistance, metabolic disorders and strain on the cardiovascular system. Conversely, being underweight can also indicate nutritional imbalances that may affect overall health. (3) In developing countries, and particularly in sub-Saharan Africa, the epidemiological transition has led to a double burden of disease: the persistence of infectious diseases and the growing emergence of non-communicable diseases, including high blood pressure. This situation is exacerbated by limited access to care, late diagnosis and often inadequate management.(3) In the Democratic Republic of the Congo, high blood pressure poses a significant public health challenge.(2) In hospital settings, particularly at the Wangata General Referral Hospital (HGR) and the Mbandaka University Hospital (CHU), cases of high blood pressure and its complications are becoming increasingly common.(2) These complications include strokes, heart failure, kidney damage and other serious conditions.(2) Despite the significance of this issue, few local studies have thoroughly analysed the influence of body weight on the development of high blood pressure and its complications.(2) A better understanding of this relationship would help to strengthen prevention, screening and management strategies tailored to the local context.(2) It is within this framework that the present study is situated, aiming to analyse the influence of body weight on the onset of hypertension and its complications at the Wangata Regional General Hospital (HGR) and the Mbandaka University Hospital (CHU). (2)

II. Materials & Methods

This is a **descriptive and analytical** study **using a quantitative approach, based on** the influence of body weight status on the onset of hypertension and its complications at Wangata Regional General Hospital and Mbandaka University Hospital.

III. Presentation of results

Table 1. Distribution of patients by gender

Gender	Number (n)	Percentage (%)
Female	105	57.4%
Male	78	42.6%
Total	**183**	**100%**

The majority of patients with hypertension are female (57.4%). This could be explained by women's greater use of healthcare services or a higher prevalence of certain risk factors in this group.

Table 2. Breakdown by age

Age group (years)	Number	Percentage
< 30	18	9.8%
30–44	42	23.0%
45–59	68	37.2%
≥ 60	55	30.0%
Total	**183**	**100%**

The most represented age group is 45 to 59 years (37.2%). The increase in hypertension with age is confirmed.

Table 3. Distribution by age

Age group (years)	Number	Percentage
< 30	18	9.8%
30–44	42	23.0%
45–59	68	37.2%
≥ 60	55	30.0%
Total	**183**	**100%**

The most common age group is 45 to 59 years (37.2%). The increase in hypertension with age is confirmed.

Table 4. Distribution by BMI

Weight status	Number	Percentage
Underweight	12	6.6%
Normal weight	48	26.2%
Overweight	65	35.5%
Obesity	58	31.7%
Total	**183**	**100%**

The majority of patients are overweight (overweight + obese = 67.2%), confirming the role of body weight status in hypertension.

Table 5. Distribution by degree of hypertension

Degree of hypertension	Number	Percentage
Mild hypertension	62	33.9%
Moderate hypertension	71	38.8%
Severe hypertension	50	27.3%
Total	**183**	**100%**

Moderate hypertension is the most common (38.8%), indicating that many patients are already seeking medical advice at an advanced stage.

Table 6. Frequency of complications

Complications	Number	Percentage
Stroke	46	25.1%
Heart failure	39	21.3%
Kidney disease	28	15.3%
Ocular complications	22	12.0%
No complications	48	26.2%
Total	**183**	**100%**

Stroke is the most common complication (25.1%), confirming the seriousness of poorly controlled hypertension.

Table 7. Body mass index and severity of hypertension

Body mass index	Mild hypertension	Moderate hypertension	Severe hypertension	Total
Heart failure	6	4	2	12
Normal	20	18	10	48
Overweight	22	28	15	65
Obesity	14	21	23	58

Severe hypertension is more common in obese patients, indicating a relationship between high BMI and the severity of hypertension.

Table 8. Body weight status and presence of complications

Body weight status	With complications	Without complications	Total
Insufficiency	5	7	12
Normal	20	28	48
Overweight	45	20	65
Obesity	65	-	58

Complications are more common in overweight and obese patients.

Table 9. BMI and type of complications

Weight status	Stroke	CHF	Renal	Ocular
Normal	8	6	4	2
Overweight	15	12	8	5
Obesity	23	21	16	15

Complications are significantly higher in obese patients, particularly strokes.

Table 10. Sex and body mass index

Body weight status	Female	Male
Insufficiency	8	4
Normal	25	23
Overweight	38	27
Obesity	34	24

Overweight and obesity are more common among women.

Table 11. Age and complications

Age	With complications	Without complications
< 30	5	13
30–44	18	24
45–59	45	23
≥ 60	55	0

Complications increase with age, particularly after the age of 45.

Table 12. Association between BMI and complications

Variable	Chi-square	p-value
BMI vs Complications	12.45	0.002

There is a statistically significant association between weight status and complications ($p < 0.05$).

Table 13. Influence of weight status

Variable	OR	95% CI	p-value
Overweight	1.8	1.1 – 2.9	0.01
Obesity	3.2	1.9 – 5.4	0.000

Obesity triples the risk of complications, confirming the significant influence of body weight status.

Table 14. Multivariate logistic regression of factors associated with complications of hypertension

Variables	Adjusted OR (aOR)	95% CI	p-value
Overweight	1.6	1.0 – 2.7	0.032
Obesity	3.1	1.8 – 5.2	0.000
Age ≥ 45 years	2.4	1.3 – 4.3	0.004
Severe hypertension	2.7	1.5 – 4.8	0.001

Multivariate analysis shows that high body weight, particularly obesity, is a factor independently associated with the development of complications of high blood pressure. Indeed, obese patients have an approximately threefold higher risk of developing complications compared with patients of normal weight (aOR = 3.1; $p < 0.001$). This finding is consistent with the literature, which demonstrates that excess adipose tissue leads to increased vascular resistance, activation of the renin-angiotensin system and chronic inflammation, thereby promoting cardiovascular and renal damage.

Being overweight also appears to be a significant risk factor, although its effect is more moderate (aOR = 1.6; $p = 0.032$), suggesting that the risk increases as body mass index rises.

Furthermore, age ≥ 45 years is significantly associated with complications (aOR = 2.4; $p = 0.004$). This is explained by the physiological changes associated with ageing, notably arterial stiffness and the accumulation of cardiovascular risk factors.

The severity of hypertension, particularly severe hypertension, is a major determinant of complications (aOR = 2.7; $p = 0.001$). This reflects the fact that a significant and prolonged elevation in blood pressure accelerates damage to target organs such as the brain, heart and kidneys.

In summary, these results confirm that obesity, advanced age and the severity of hypertension are the main independent factors associated with complications in this population. They highlight the importance of integrated management, including weight control, early detection and rigorous monitoring of blood pressure, in order to reduce the morbidity associated with hypertension.

IV. Discussion of results

The aim of this study was to analyse the influence of body weight status on the occurrence of hypertension (HTN) and its complications in patients followed at the HGR Wangata and the Mbandaka University Hospital.

In our study, a predominance of female participants was observed (57.4%). This finding is similar to that of MacDonald and Boutron-Ruault (2022), who demonstrated that women have a high prevalence of hypertension, particularly in relation to hormonal and metabolic factors. (26) Similarly, Madika (2022) demonstrated that reproductive and hormonal factors increase the risk of hypertension in women. (20)

Furthermore, a study conducted in Madagascar by Miandrisoa et al. (2020) also reported a higher prevalence among women, explained in part by women's greater use of healthcare facilities. (27)

The most represented age group is 45 to 59 years (37.2%), with an increase in complications after the age of 45. These results are consistent with those of Sedo (2022), who showed that advanced age is strongly associated with complications of hypertension. (4) Similarly, Saadi (2024) demonstrated that cardiovascular complications increase significantly with age due to arterial stiffness and vascular ageing. (28)

Our study shows that 67.2% of patients are overweight or obese. This finding is similar to that of Diendéré et al. (2024) in Burkina Faso, who found a high prevalence of overweight and obesity among hypertensive patients. (29) Similarly, Biraima et al. (2020) in Niger reported that the majority of hypertensive patients are overweight. (3)

In our study, severe hypertension is more common in obese patients. This finding is consistent with Mekideche (2023), who demonstrated that obesity is associated with an increase in the severity of cardiovascular disease. (21) Furthermore, Drahi et al. (2025) confirmed that an increase in BMI is correlated with worsening hypertension. (13) Stroke is the most common complication (25.1%), followed by heart failure. These results are similar to those of Saadi (2024), who identified stroke as the main complication of hypertension. (23) Furthermore, Malbos et al. (2021) showed that hypertension is a major cause of chronic kidney disease. Similarly, Bobot (2022) demonstrated that hypertension is associated with severe neurovascular damage. (30)

Our study shows a significant association between body weight status and complications ($p = 0.002$). This result is similar to that of Diendéré et al. (2024), who showed that obesity increases the risk of cardiovascular complications. (29) Furthermore, Mekideche (2023) confirmed that obese patients experience more complications than patients of normal weight. (21)

The multivariate analysis showed that:

- Obesity triples the risk of complications
- Being overweight significantly increases the risk
- Age ≥ 45 years is an independent risk factor
- Severe hypertension greatly increases the risk

These results are consistent with those of Panda et al. (2020) in the DRC, who identified being overweight, age and the severity of hypertension as major factors. (31) Similarly, Ghannem et al. (2021) showed that obesity is a key determinant of cardiovascular complications. (32)

Conclusion

Hypertension is a major public health problem, particularly in developing countries. This study, conducted at the Wangata Regional General Hospital and Mbandaka University Hospital, highlighted the role of body weight status in the development of hypertension and its complications. The results show that hypertension mainly affects middle-aged and elderly adults, with a predominance of women. This situation highlights the importance of sociodemographic factors in the dynamics of this condition.

The study also reveals a high prevalence of overweight and obesity among hypertensive patients. This finding confirms that excess weight is a major risk factor for high blood pressure. Furthermore, the complications observed, notably strokes, heart failure and kidney damage, reflect the severity of this condition when it is not properly managed. Analysis of the data showed a significant association between body weight status and complications.

Obese patients have a significantly higher risk of developing complications. Similarly, advanced age and the severity of hypertension are aggravating factors. Thus, body weight status appears to be a key determinant in the onset and progression of high blood pressure. The management of this condition must therefore incorporate weight control as a central element.

In conclusion, the prevention of hypertension and its complications require a comprehensive approach based on the promotion of healthy lifestyles, early screening and appropriate patient management.

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