Profiling Health Indicators: A Study of Protein and Cholesterol Levels among Male Medical Doctors in Aba, Abia State, Nigeria

ABSTRACT

Aim: This research aimed to profile the health indicators of male medical doctors in Aba, Abia State, Nigeria, by examining protein and cholesterol concentrations.

Methodology:This research adopted a cross-sectional study to investigate the health profile of practicing doctors in Aba, Abia State. The study focused on doctors aged forty years and above, encompassing both seasoned professionals and those in the early stages of their careers.The research was conducted during the zonal meeting of the Nigerian Medical Association (NMA) in the Aba zone, coinciding with official clinic consultations. The sampling method employed was purposive, with participation based on voluntary consent. A targeted approach resulted in a cohort of 59 male doctors, chosen strategically to gain insights into the health status of this specific demographic.To assess their health parameters, blood samples were collected using standard venepuncture techniques. The samples were subsequently analyzed for concentrations of total protein, albumin, globulin, and cholesterol using an automatic biochemical analyzer. This approach allowed for a comprehensive understanding of the biochemical profile of the selected cohort, contributing valuable insights into the overall health and well-being of practicing male doctors in the region.

Results: Our findings indicated that most of the doctors (59.32%) had total protein levels in the 6.0-6.9 mg/dL range. A considerable proportion of the population showed albumin concentrations in the 5.0-5.9 mg/dL (54.24%) and 4.0-4.9 mg/dL (44.07%) brackets. In terms of globulin, the majority of the doctors (52.54%) presented levels between 1.0-1.9 mg/dL. Cholesterol concentrations revealed that the largest group of doctors (33.90%) fell in the 4.0-4.9 mmol/L category, followed by those in the 3.0-3.9 mmol/L and 5.0-5.9 mmol/L brackets (25.42% and 23.73% respectively).

Conclusion: These findings provide a valuable profile of health indicators among this population and may serve as a reference for further investigations to promote healthcare professionals' wellness. Future studies should also consider other potential determinants of these health markers, such as dietary habits, lifestyle, stress levels, and exercise routines.

Keywords: Cholesterol, Health indicators, Protein, Medical Doctors

1. INTRODUCTION

The escalating incidence of non-communicable diseases (NCDs) is a global health concern [1]. This is particularly true for low and middle-income countries, such as Nigeria, where the double burden of infectious diseases and NCDs poses a considerable public health challenge [2]. Among the leading NCDs, cardiovascular diseases (CVDs) hold a prominent position, accounting for a significant proportion of the global burden of disease and mortality [3]. A fundamental understanding of the biological markers associated with the risk of these diseases, such as cholesterol and protein levels, is paramount for early identification, prevention, and management strategies [4].

The medical profession is a demanding occupation, associated with a high level of stress [5]. The significant work-related stress, irregular dietary habits, and sedentary lifestyle often experienced by

doctors might contribute to an altered metabolic profile, potentially increasing the risk of developing NCDs [6]. While a considerable number of studies have profiled health indicators in various populations, the health status of doctors, specifically in Nigeria, has not been sufficiently studied. The necessity to profile health indicators within this demographic can provide invaluable insights for health promotion and disease prevention in this critical group.

Despite significant advancements in health care and knowledge, physicians are not immune to health problems. One such concern lies within the area of nutritional health, specifically protein and cholesterol levels. Though medical doctors are more aware of the consequences of poor dietary habits, less attention has been given to their health indicators in existing research [7]. The problem becomes more pronounced in regions like Abia State, Nigeria, where access to a balanced diet and lifestyle habits can be compromised due to socio-economic factors, and where the stressful working conditions of doctors may aggravate the risks [8].

Medical doctors, being the key personnel in healthcare delivery, are expected to lead healthy lifestyles, which is crucial to maintain their performance, resilience, and well-being [9]. Protein is essential for maintaining and repairing body tissues, and low protein intake can lead to muscle weakness, fatigue, and poor concentration [10], impacting a doctor's ability to perform optimally. On the other hand, high cholesterol levels increase the risk of heart diseases and stroke, which are leading causes of mortality and morbidity worldwide [11]. These factors together may compromise the health and productivity of the doctors and indirectly influence the quality of care they provide.

In this context, it is surprising that few studies have focused on the health indicators of male medical doctors in Abia State, Nigeria, particularly in terms of protein and cholesterol levels. This presents a significant gap in the literature, as the health status of these medical professionals is important not only for their personal well-being but also for their capacity to deliver high-quality healthcare services [12]. Furthermore, understanding the protein and cholesterol levels among this specific population could offer insights into health risks, dietary habits, and lifestyle choices, as well as guide potential interventions for improvement.

This research aims to address the following problem: What is the state of protein and cholesterol levels among male medical doctors in Abia State, Nigeria? The findings of this study will contribute to the limited body of knowledge in this area, providing valuable insights for healthcare policymakers, hospital administrators, and the doctors themselves.

2. METHODOLOGY

This study employed a cross-sectional survey design, recognized for its efficacy in observing large populations at a specific point in time or within a brief timeframe, allowing for the simultaneous collection of data on specific variables [13]. The research focused on the demographic of practicing doctors in Aba, Abia State, comprising individuals spanning various age groups. Data collection occurred during the zonal meeting of the Nigerian Medical Association (NMA) Aba zone, concurrently with official clinic consultations. A purposive sampling method was employed, with inclusion criteria requiring participants to provide voluntary consent. The decision to selectively include male doctors was strategic, driven by the aim to gain insights into the health status of this specific demographic, resulting in the recruitment of a total of fifty-nine (59) participants.

Standard venipuncture techniques were employed to collect blood samples, subsequently analyzed for concentrations of total protein, albumin, globulin, and cholesterol using an automatic biochemical analyzer. Total protein levels were determined using the biuret method, albumin via the bromocresol green method, and globulin by subtracting albumin from the total protein [14]. Cholesterol levels were measured using an enzymatic colorimetric test [15,16].

The collected data were categorized based on the concentrations of total protein, albumin, globulin, and cholesterol in the blood samples. Subsequently, the frequency and percentage of participants within each category were calculated, providing a comprehensive understanding of the biochemical profile of the study participants.

3. RESULTS

The result of the total protein concentration in the blood is presented in Figure 1. The most common range is 6.0 - 6.9 mg/dL, with 59.32% of the sample falling into this category. Albumin concentration in the blood is presented in Figure 2. The majority (54.24%) of the individuals have a concentration of 5.0 - 5.9 mg/dL, while only 1 person (1.69%) had a concentration less than 4.0 mg/dL.The results of the globulin concentration in this study is presented in Figure 3. More than half of the individuals (52.54%) have a concentration within the range of 1.0 - 1.9 mg/dL, while very few (3.39%) fall in the 3.0 - 3.9 mg/dL category.The most common cholesterol level range is 4.0 - 4.9 mmol/L, seen in 33.90% of the doctors. Few individuals have a cholesterol level of 7.0 mmol/L or higher (3.39%) (Figure 4).

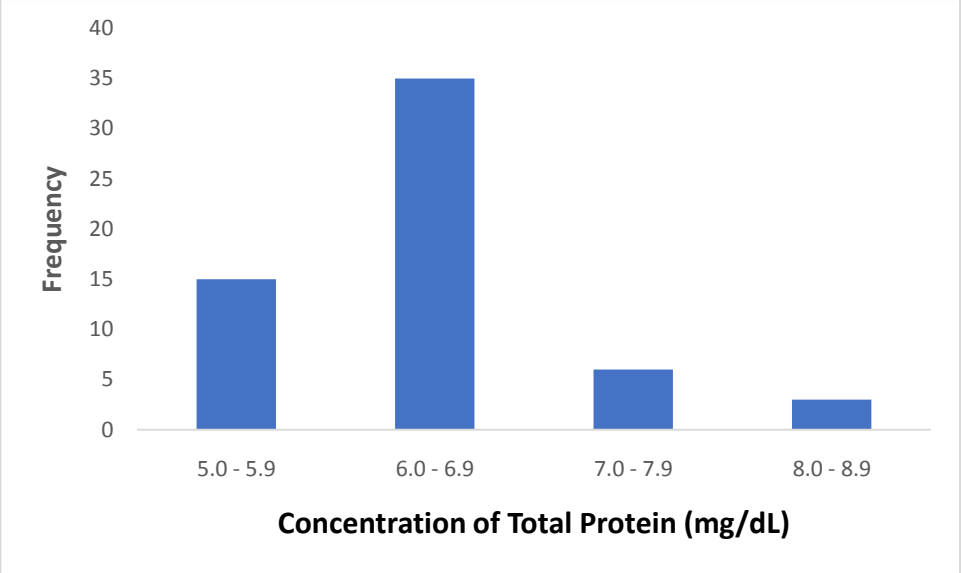

Figure 1: Concentration of Total Protein in Male Medical Doctors

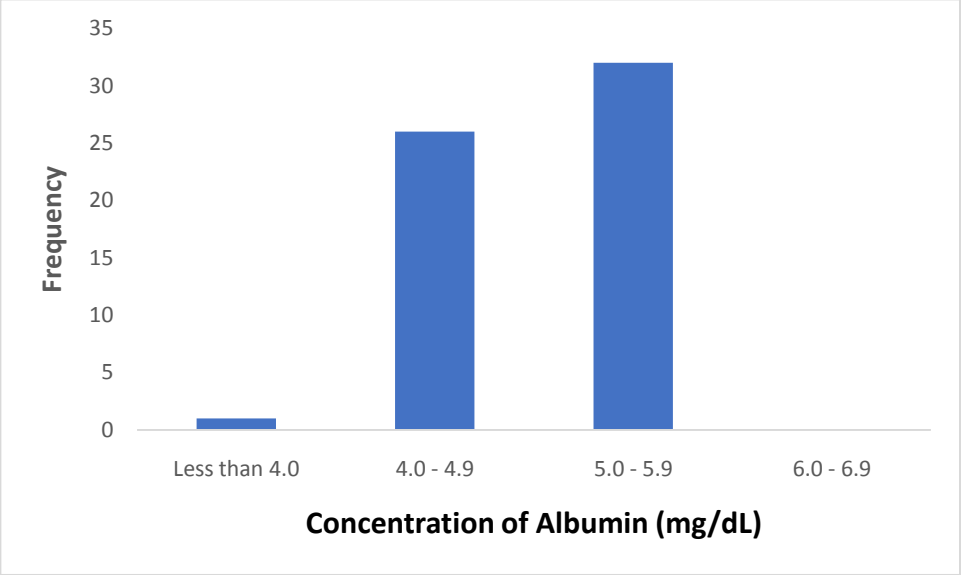

Figure 2: Concentration of Albumin in Male Medical Doctors

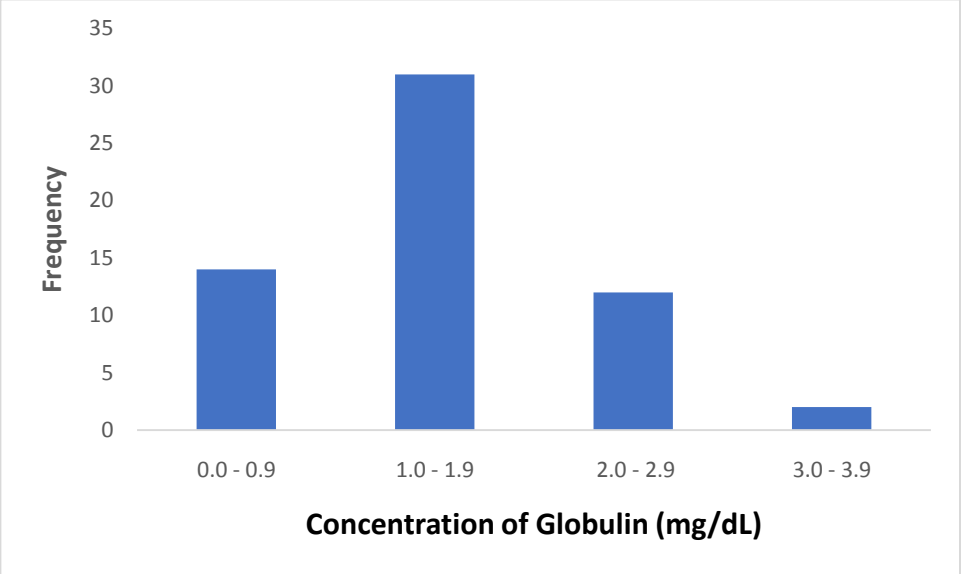

Figure 3: Concentration of Globulin in Male Medical Doctors

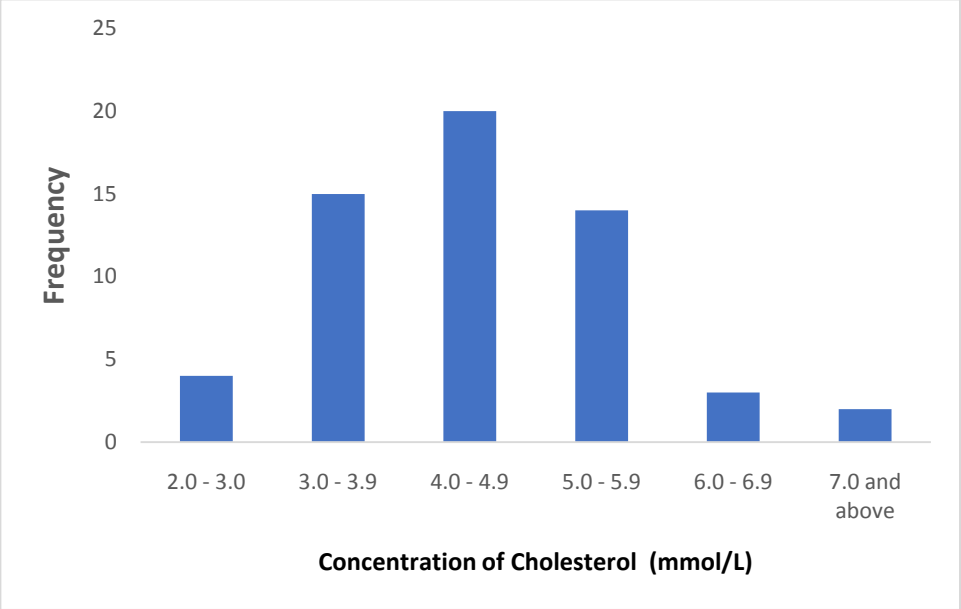

Figure 4: Concentration of Cholesterol in Male Medical Doctors

4. DISCUSSION

This study investigates the protein and cholesterol levels among male medical doctors in Abia State, Nigeria. It aims to profile health indicators in this particular demographic, focusing on protein and cholesterol concentrations. Protein is a fundamental component of all living cells and is necessary for the growth and repair of body tissues [17].

The study consisted of 59 male medical doctors from various age brackets and specializations. The total protein concentration of these individuals was divided into five ranges: 5.0-5.9, 6.0-6.9, 7.0-7.9, 8.0-8.9, and 9.0-9.9 mg/dL. Protein is an essential component for the human body, and its levels could suggest health status [18]. As per the American Association for Clinical Chemistry [19], the normal range for total protein levels is typically between 6.0 to 8.3 mg/dL. However, it's worth noting that these ranges may vary slightly depending on the laboratory that analyzes the sample.

The data showed that the majority (59.32%) of the doctors had protein levels ranging from 6.0 to 6.9 mg/dL. This falls within the lower end of the normal protein level range, indicating that a majority of the doctors maintained a normal protein concentration. 25.42% of the participants had slightly lower protein levels, falling within the 5.0-5.9 mg/dL range. It is noteworthy to mention that these levels are marginally below the normal range. Low protein levels could be indicative of a variety of health conditions, including malnutrition, liver disease, or kidney problems [10,20].

A minority of the doctors (10.17%) fell within the 7.0-7.9 mg/dL range, and a smaller fraction (5.08%) had protein levels ranging from 8.0 to 8.9 mg/dL. Both these groups are within the upper half of the normal protein concentration range. Elevated protein levels could be indicative of conditions like chronic inflammation, infection, bone marrow disorders, or even certain types of cancer [21].

While the results demonstrate that most male doctors in the sample are within the normal range for protein concentration, a significant portion had slightly lower than normal levels. It underscores the importance of regular health check-ups and a balanced diet rich in protein for this population. However, this study cannot determine the underlying causes for the varying protein levels.

The health status of healthcare professionals is crucial not only for their personal well-being but also for the patients they cater for. Research has consistently demonstrated the impact of physician health on the quality of patient care [22].

The albumin concentration in this study ranged from less than 4.0 mg/dL to 5.9 mg/dL, with none of the participants having a level in the range of 6.0 to 6.9 mg/dL.Understanding the albumin levels of this particular cohort provides insights into their nutritional status, liver function, and overall health condition [23].

Interestingly, the majority (54.24%) of the doctors had albumin levels in the range of 5.0-5.9 mg/dL, and 44.07% had albumin levels in the range of 4.0-4.9 mg/dL which were within the normal range, signifying a good nutritional status and proper liver function. It suggests that these individuals might have a balanced diet and a healthy lifestyle [24].

Albumin is a protein manufactured by the liver that plays a vital role in many functions in the body, including maintaining fluid balance, transporting hormones and drugs, and acting as an antioxidant [25]. The concentration of albumin in the blood can be an essential indicator of an individual's health status, as low levels can signify liver disease or malnutrition, while high levels may indicate dehydration [26].

Given the unique characteristics of the participant pool (male medical doctors), this study's findings are intriguing. The demographic's advanced understanding of health and nutrition may contribute to their largely healthy albumin levels. However, it underscores the importance of continued health monitoring and maintenance, even among healthcare professionals, to detect and promptly address potential health risks [27].

The study's findings, as presented in Figure 3, illustrate a varying distribution of globulin concentrations among the participants. Globulins are proteins synthesized in the liver and immune system, and they play vital roles in the body, such as transporting lipids and fat-soluble vitamins, and forming antibodies for immune response [28]. The concentration of globulins can be indicative of different health conditions. Abnormally high levels may signify chronic inflammatory conditions, autoimmune diseases, or infections, while low levels can point towards issues like liver or kidney disease [29].

As per the presented results, the majority of participants (52.54%) had globulin levels ranging from 1.0 to 1.9 mg/dL, which is generally within the typical range for adult males (0.8 to 2.0 g/dL) according to most standard medical references [30]. These findings suggest that a significant majority of the participants maintain appropriate protein synthesis and immune functions, given the integral role of globulins.

On the other hand, 23.73% of the doctors presented with globulin levels below the typical range (0.0 - 0.9 mg/dL). This could potentially denote severe conditions such as nephrotic syndrome, where the kidneys fail to retain proteins, leading to protein loss in urine [31]. As previously mentioned, low globulin levels could indicate liver or kidney diseases, malnutrition, or other conditions that inhibit protein synthesis or increase protein loss. However, it is important to note that these potential conditions are merely speculative based on globulin levels alone. A more comprehensive evaluation of these doctors, considering additional health indicators and clinical symptoms, would be required to make definitive diagnoses.

Globulin is a group of proteins in the blood that includes the antibodies responsible for fighting against diseases. They are produced in the liver and play crucial roles in liver function, blood clotting, and immune health. The standard globulin levels are usually within the range of 2.0 - 3.5 g/dL [32].

Only 3.39% had levels in the range of 3.0 - 3.9 mg/dL, which falls above the typical range. Elevated globulin levels could potentially indicate conditions such as multiple myeloma, a cancer of plasma

cells that produce excess amounts of certain proteins [33]. It could also indicate the presence of chronic inflammatory conditions, autoimmune diseases, or infections, as mentioned earlier.

The study's results indicate a need for further investigation and potentially more frequent health screenings among this professional group, particularly for those with abnormal globulin levels. The specific factors contributing to the observed abnormalities could be numerous, encompassing genetics, lifestyle, professional stress, dietary habits, and other potential health complications.

This study fills a critical gap in understanding the health of male doctors in Abia State, Nigeria, by profiling essential health indicators. It aligns with the findings of other regional studies [34], emphasizing the relevance of monitoring and improving health among healthcare professionals, who are often at the forefront of disease management and prevention. However, it also highlights the need for broader and more detailed research to fully understand the health patterns among Nigerian healthcare professionals and devise effective interventions.

These findings highlight the potential health challenges facing this demographic and underline the importance of routine medical check-ups among healthcare professionals themselves. Despite their medical knowledge and proximity to healthcare services, these professionals might be susceptible to various health issues due to factors like stress, long working hours, and potential neglect of personal health [35].

However, caution must be taken when interpreting these results. The ranges provided do not clearly align with the standard reference ranges for globulin levels, and additional information on the methodology used for this research is necessary for an accurate understanding. Also, this study uses a specific group, so the results may not be generalizable to broader populations.

Cholesterol concentration is a key indicator of cardiovascular health. Elevated cholesterol levels, particularly low-density lipoprotein (LDL) cholesterol, increase the risk for heart disease and stroke [36]. In Figure 4 of the study, the researchers document cholesterol levels in various ranges and the frequency and percentage of doctors falling into each range.

A majority of the doctors (33.90%) had cholesterol levels in the 4.0 - 4.9 mg/dL range. These results align with the fact that a cholesterol level within this range is considered acceptable for adults, though it is on the higher end of the scale [37].

However, the 23.73% of male doctors who fall within the 5.0 - 5.9 mg/dL cholesterol level range are entering a territory associated with an increased risk of heart disease. The National Heart, Lung, and Blood Institute [38] suggests that a cholesterol level above 5.2 mg/dL indicates a higher risk of heart disease.

An alarming observation is the 8.47% of doctors who had cholesterol levels of 6.0 mg/dL or higher, a range that is significantly associated with a high risk of heart disease [39]. This study's results demonstrate the critical need for cholesterol management and health awareness, even among healthcare providers themselves.

The smaller group of doctors (6.78%) had cholesterol levels in the lower range of 2.0 - 3.0 mg/dL, which are generally considered optimal. However, extremely low levels of cholesterol can also raise health concerns, including the risk for stroke, certain types of cancer, and other health problems [40]. Therefore, more specific data about the type of cholesterol (LDL or HDL) would be useful to fully interpret these results.

While the research provides a comprehensive view of the cholesterol levels among male medical doctors in Abia State, Nigeria, it also underscores the need for health promotion activities, regular health screenings, and improved lifestyle habits among these healthcare professionals.

The prevalence of elevated cholesterol levels among medical doctors, a population presumably more knowledgeable about the risks associated with high cholesterol, highlights the necessity for more widespread public health interventions targeting cholesterol management.

5. CONCLUSION

This study provides an important overview of the health indicators among male medical doctors in Abia State, Nigeria, focusing on protein and cholesterol levels. While the majority of participants showed protein, albumin, and globulin levels within healthy ranges, there was a notable proportion of participants with abnormal levels. Similarly, cholesterol levels among the participants showed a considerable percentage within the risky range. These findings underscore the importance of regular health check-ups and lifestyle management, even for medical professionals who are often considered to be more aware of health issues. The data generated from this study could be used to inform targeted health interventions among this specific demographic.

6. RECOMMENDATIONS

Based on the findings from the study are some recommendations for further research and practical implications:

i. **Exploration of Dietary Intake**: The study shows that a significant proportion of the subjects had a total protein concentration of between 6.0 - 6.9 mg/dL (59.32%), which is generally considered normal. However, more research is needed to identify dietary intake among these subjects, as diet plays a critical role in the regulation of protein levels.
ii. **Detailed Medical History**: Only a small percentage (3.39%) of the subjects showed high cholesterol levels (7 and above mg/dL). However, it is recommended that a detailed medical history, including family history of cardiovascular diseases, be taken into consideration in future studies. This can provide additional context to understand these results better.
iii. **Age-Specific Analysis**: Future research should consider age-specific analysis, as age can significantly affect protein and cholesterol levels.
iv. **Gender Comparison Studies**: While this study focused on male medical doctors, it would be beneficial to compare these results with a similar study conducted among female medical doctors in the region. This can provide valuable gender-based insights into these health indicators.
v. **Longitudinal Study**: A longitudinal study could be conducted to assess the change in protein and cholesterol levels over time. This could provide useful data on how these health indicators vary with age and career progression among medical doctors.

7. LIMITATIONS OF STUDY

Despite our best efforts, the study has some limitations. First, the cross-sectional design prevents us from drawing any causal relationships. Secondly, the study relied on single-point measurements, which might not represent participants' average levels due to potential biological fluctuations. Thirdly, lack of more demographic information. This was as a result of limited time because it was a one-day meeting and emphasis of the study was on blood sample analysis to determine their health status. This is open for future research. Finally, the study was conducted among male medical doctors in Abia State, Nigeria, limiting the generalizability of the findings.

Ethical Approval and Consent:

This study adhered strictly to the ethical guidelines for human research, including voluntary participation, informed consent, and the right to withdraw at any time. The study received ethical approval from the ethical review board of the hospitals involved.

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