Lipid Profile, Atherogenic Index of Plasma, and Anthropometric Measurements Among Osteoporotic Postmenopausal Sudanese Women: Possible Risk for Cardiovascular Disease

Abdelgadir Elmugadam

Sudan University of Science and Technology

Ghada A. Elfadil (✉ omheba04@gmail.com)

Sudan University of Science and Technology

Abdelrahman Ismail Hamad

Sudan University of Science and Technology

Mawahib Aledrissy

National Ribat University

Hisham N. Altayb

King Abdulaziz University

Ahlam Badreldin Elshikieri

Taibah University

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Abstract

Background: Osteoporosis and menopausal women's health had paucity data from Africa, especially Sub-Saharan countries. The current study aimed to assess the relationship between lipid profile, atherogenic Index of Plasma (AIP), anthropometric measurements, and the risk of cardiovascular disease (CVD) among osteoporotic Sudanese postmenopausal women.

Methods: An epidemiological, cross-sectional comparative, community-based study was conducted. Postmenopausal women (n = 300), aged 47- 90 years, with an average one year postmenopause, were recruited from various centers in Khartoum State. Dual-energy X-ray absorptiometry (DEXA) was used to assess bone density. DEXA scan was interpreted in terms of T-score as per World Health Organization guidelines. Weight, height, and waist circumference were measured twice following standard protocols. In addition, fasting blood samples (5ml) were collected for the determination of total cholesterol (TC), triglycerides (TG), low-density lipoprotein cholesterol (LDL-C), and high-density lipoprotein cholesterol (HDL-C). AIP was calculated as an indicator for CVD risk. Blood samples were assayed on the Roche/Hitachi Cobas c311 system (Roche Diagnostics GmbH, Germany). Statistical analysis was carried out using SPSS version 26.

Results: The mean age of the postmenopausal women was 61.7 ± 10.3 years, with 80 women having normal T-score and an equal number of osteoporotic and osteopenic (n = 110 each). Most women (59%) aged 47-64 years. The prevalence of osteoporosis was 36.7%. Many postmenopausal women with normal BMD suffered from general (68%) and central obesity (94%) compared with their counterparts. Hypercholesterolemia, hypertriglyceridemia, high LDL-C, hypo-HDL-C were identified among 26.4%, 31%, 16.3%, and 32.7% osteoporotic women respectively. Osteoporotic postmenopausal (36.4%) women had medium to high risk of CVD according to their AIPs. There was a significantly inverse correlation between age and HDL-C ($r = -0.205$; $p = 0.032$) whereas positive association between AIP and TC ($r = 0.230$; $p = 0.016$), among osteoporotic women. Osteoporotic (52%) and osteopenic (42%) women had ≥ 2 CVD risk factors. Multiple Linear regression analysis showed T-score value decreased significantly with age and AIP and increased with BMI.

Conclusion: Osteoporosis is prevalent among Sudanese postmenopausal women who are at increased risk for CVD. Necessary steps are needed for public education and wider dissemination of information about osteoporosis, CVD and their prevention.

Background

During menopause, which is the end of the reproductive life, ovaries fail to produce enough estrogen. Consequently, postmenopausal women are prone to diseases including osteoporosis (OP), cardiovascular diseases (CVD), and dyslipidemia[1]. Osteoporosis, a bone-thinning illness, can lead to fractures and has emerged as a major public health concern[2]. Approximately 200 million people worldwide are affected by OP, with nine million osteoporotic fractures occurring per year, 1.6 million of which impact the hip joint [3].

Low bone mineral density (BMD) is the primary cause of OP[4]. Ageing, becoming a woman, reduced physical activity levels, a low calcium intake, and hypothyroidism are all risk factors for OP [4, 5].

Furthermore, CVDs are one of the most common causes of death worldwide, and their prevalence is rising [6]. Both OP and CVDs appear to share pathophysiological pathways and risk factors, such as ageing and inflammation[7]. Several prospective studies have suggested that as women enter menopause, there is a marked increase in CVD risk, with a greater likelihood of myocardial infarction and all-cause mortality[8, 9]. Lampropoulos and colleagues have indicated that OP correlated with vascular calcification and hyperlipidemia[10]. On the other hand, several studies revealed that HDL-C and increased body weight are the protective factors of OP [11, 12].

In addition, studies focusing on OP prevalence and fragility fracture incidences are mainly in North and South Africa. National OP treatment guidelines have been published in Tunisia, Libya, Egypt, Morocco, and South Africa[13, 14]. A recent study investigating the prevalence of hip fractures amongst black South Africans showed an age-adjusted hip fracture rate of 69.2 per 100,000 per annum and 73.1 per 100,000 per annum for women and men, respectively [15]. However, none of the sub-Saharan African countries, excluding South Africa, have a national guideline on the management of OP. Also, epidemiological studies reporting the prevalence of hip fracture or vertebral fractures are limited in Sub-Saharan Africa. The published work is based on retrospective data, the way OP is diagnosed, including small sample size, and from a single study site [16]. Moreover, there is a scarcity of publications focusing on CVD risk among osteoporotic African women.

Sudan, which is one of the Sub-Saharan African countries, suffers from the double burden of over-and under-nutrition. Recently, there are reports of an increased prevalence of chronic diseases, including CVD. Osteoporosis remains a neglected disease in Sudan, and there are no age-standardized reference data available to accurately screen and diagnose individuals. Furthermore, CVD risk factors among osteoporotic postmenopausal women have not been studied. Therefore, the current study aimed to determine selected CVD risk factors among osteoporotic-osteopenic postmenopausal Sudanese women.

Methods

Study design and participants

An epidemiological, cross-sectional comparative, facility-based study was conducted between January 2018 and December 2019 in Khartoum State, the capital of Sudan. Various orthopaedic outpatient clinics were visited for the selection of the study sample. Postmenopausal women whose last menses were at least a year ago were eligible. In addition, women with no previous history of hepatic, renal, thyroid dysfunction, heart disease, diabetes, hypertension, hormonal replacement therapy, lowering lipid drugs, and/or medications that could alter bone metabolism or lipid profile were recruited.

Diagnostic criteria for osteoporosis and osteopenia

Dual-energy X-ray absorptiometry (DEXA) was used to measure bone mineral density (BMD) in g/cm² in the proximal femur and lumbar spine using Hologic Inc. ASY00409 X-Ray Controller for Hologic Discovery Bone Densitometry. According to the symptoms, signs, and bone mineral density T-score, women were diagnosed by an Orthopaedic. Osteopenia was diagnosed with T-score of >-2.5 and ≤ -1 , whereas osteoporosis with a T score of ≤ -2.5 based on the World Health Organization (WHO) diagnostic classification[17]. In the current study, women's results were presented based on having a normal T-score, osteopenia, or osteoporosis.

Data collection

Anthropometric measurements:

Weight was measured twice following published protocols. The OMRON - Body Fat Scale (BF508I, China) was used after being calibrated. Women were asked to remove heavy clothes, shoes and accessories and readings were taken to the nearest 0.1g. A portable stadiometer (SECA-213 model, Germany) was used after calibration to measure height twice, and women were asked to remove their shoes. Quetelet Body Mass Index (BMI) was calculated using standard formulas (weight in kilogram $\div$ height in meters square). The WHO classification was used to define BMI as follows: underweight (<18.5 kg/m²), normal (18.5- 24.9 kg/m²), overweight (25.0- 29.9 kg/m²), obese (≥ 30 kg/m²) [18].

Waist circumference (WC) was measured twice using a non-stretchable measuring tape. Women fasted for 8 hours. Measurements were made at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest. Readings were taken from the right side of the body. The cutoff values associated with increased CVD risks in women were set at >88 cm [19].

Blood sampling and biochemical measurements

After a minimum of 8 hours of overnight fasting, peripheral blood (5mL) was drawn in plain containers. The lipid profile (total cholesterol, triglyceride, LDL-C, and HDL-C) was assayed in serum samples on the Roche/Hitachi Cobas c311 system (Roche Diagnostics GmbH, Germany). The precision and accuracy of the techniques used in this study were checked each time, and each batch was analyzed by including commercially prepared control sera. Serum cholesterol was classified as: normal <200 mg/dL, borderline 200-239 mg/dL, and high ≥ 240 mg/dL; triglycerides: normal <150 mg/dL, borderline high 150-199 mg/dL, and high ≥ 200 mg/dL; LDL-C: normal level <130 , borderline high 130-159 mg/dL, high 160-189 mg/dL, and very high >189 mg/dL; HDL-C: optimal ≥ 60 mg/dL, borderline low 59-41 mg/dL, and low ≤ 40 mg/dL [24]. The Atherogenic Index of Plasma (AIP) was calculated as the logarithmical transformed ratio of molar concentrations of TG to HDL-C [20]. The AIP was classified as: low CVD risk <0.1 , medium risk 0.1-0.24, and high risk >0.24 [20].

Furthermore, the number of CVD risk factors among women were independently calculated based on their BMI (>25 kg/m²), serum cholesterol (>200 mg/dL), triglycerides (>150 mg/dL), LDL-C (>130 mg/dL), and HDL <40 mg/dL.

Quality assurance

Data collectors attended three training sessions. These sessions included how to take anthropometric measurements, collect blood samples, and analyze blood samples.

Ethical considerations

Ethical approval was obtained from the Deanship of Scientific Research at the Sudan University of Science and Technology (NO: DSR-IEC-03-08). All the procedures used in this study met the current revision of the Helsinki Declaration. The study protocol was explained to women who provided a signed consent before the start of the study. It is important to note that the enrollment in the study was voluntary, and no incentives were provided to women.

Statistical analysis

Data were coded, and statistical analysis was performed with Social Package of Statistical Science (SPSS) version 26.0 (SPSS Inc., Chicago, IL, USA). The Kolmogorov–Smirnov test was used for testing the normality of continuous data (age, waist circumferences, BMI, total cholesterol and triglycerides, LDL-C, HDL-C levels). Continuous variables with normal distribution were presented as Mean (SD), whereas continuous variables with skewed distribution were presented as Median with Interquartile Ranges. The Analysis of Variance (ANOVA) test was used to determine the differences between the three groups of women. Spearman correlation was used to find the association between variables. The Multiple Linear Regression model was also used to determine the most significant risk factors which affected the T-score values. The significance level was set at ≤ 0.05 .

Results

Women (n = 400) were recruited, with 300 fulfilling the inclusion criteria, giving a response rate of 75%. Women (n = 80, 26.7%) had normal T-score, whereas 220 had either osteopenia (n = 110, 36.7%) or osteoporosis (n = 110, 36.7%). Women with normal T-score were younger than their counterparts. Many normal T-score women suffered from general and central obesity compared to osteopenia and osteoporosis (Table 1). Only one osteopenic woman was underweight (data not shown in Table 1).

Table 1

Age and anthropometric measurements of normal BMD, osteopenic and osteoporotic Sudanese women.

	Normal T-score	Osteopenia	Osteoporosis	Total	P-value*
Age (years)					
Mean (SD) [#]	56.8 (8.1)	60.4 (8.9)	66.5 (10.9)	61.7 (10.3)	0.0001
47–64	65 (81.2) ‡	70 (63.6)	43 (39.1)	178 (59.3)	
65–90	15 (18.8)	40 (36.4)	67 (60.9)	122 (40.7)	
BMI (kg/m²)					
Mean (SD) [#]	33.1 (6.2)	29.1 (5.8)	29.6 (5.7)	30.4 (6.1)	0.0001
Normal	5 (7.6) ‡	21 (24.7)	24 (26.1)	50 (20.6)	
Overweight	16 (24.2)	27 (31.8)	15 (16.3)	58 (23.9)	
Obese	45 (68.2)	36 (42.4)	53 (57.6)	134 (55.1)	
Waist circumference (cm)					
Mean (SD) [#]	108.7 (13.9)	101.6 (11.7)	102.5 (16.6)	103.9 (14.54)	0.006
≤88	4 (6.0) ‡	10 (11.8)	19 (20.7)	33 (13.6)	
> 88	62 (94.0)	75 (88.2)	73 (79.3)	210 (86.4)	
[#] Mean = Geometric mean; SD = standard deviation; ‡Values are numbers and percentages; *P-value is obtained using ANOVA test.					
Normal BMD women (n = 66) had their BMI and waist circumference data available					
Osteopenic women (n = 85) had their BMI and waist circumference data available					
Osteoporotic women (n = 92) had their BMI and waist circumference data available.					

There were no significant differences among women concerning their lipid profiles. Overall, 25% of the postmenopausal women suffered from hypercholesterolaemia. The HDL-C level among most women was within the borderline low range (Table 2). Moreover, based on their AIP values, nearly 30% of women had medium to high CVD risk (Table 2).

Table 2
Lipid profile of Normal BMD, Osteopenic, and osteoporotic Sudanese women.

	Normal T-score	Osteopenia	Osteoporosis	Total	P-value*
Total Cholesterol (mg/dL)					
Mean (SD) [#]	173.7 (38.2)	174.7 (44.3)	181.9 (41.3)	177.1 (41.7)	0.305
Normal < 200	61 (76.2) ‡	85 (77.3)	81 (73.6)	227 (75.7)	
Borderline 200–239	16 (20.0)	17 (15.5)	20 (18.2)	53 (17.7)	
High ≥ 240	3 (3.8)	8 (7.3)	9 (8.2)	20 (6.7)	
Triglycerides (mg/dL)					
Median (Q1-Q3) [†]	112 (91–153)	109.0 (89–141)	108.5 (86.5–154.3)	111 (90–150)	0.666
Normal < 150	59 (73.7) ‡	88 (80.0)	76 (69.1)	223 (74.3)	
Borderline high 150–199	16 (20.0)	15 (13.6)	21 (19.1)	52 (17.3)	
≥ 200	5 (6.2)	7 (6.4)	13 (11.8)	25 (8.1)	
LDL-C (mg/dL)					
Mean (SD) mg/dL	93.9 (27.0)	92.5 (32.8)	99.5 (32.1)	95.5 (31.2)	0.221
Normal < 130	71 (88.8) ‡	96 (87.3)	92 (83.6)	259 (86.3)	
Borderline high 130–159	8 (10)	9 (8.2)	14 (12.7)	31 (10.3)	
High 160–189	1 (1.2)	4 (3.6)	3 (2.7)	8 (2.7)	
Very high > 189	-	1 (0.9)	1 (0.9)	2 (0.7)	
HDL-C (mg/dL)					
Median (Q1-Q3)	47 (38–58)	45.5 (35–57.5)	47.0 (38–58)	46.5 (37–48)	0.412
Optimal ≥ 60	22 (27.5) ‡	26 (23.6)	24 (21.8)	72 (24.0)	
Borderline low 59 – 41	34 (42.5)	40 (36.4)	50 (45.5)	124 (41.3)	
Low ≤ 40	24 (30.0)	44 (40.0)	36 (32.7)	104 (34.7)	

[#]Mean = Geometric mean; SD = standard deviation; [†]Median, Q1-Q3 Interquartile Ranges, [‡]Values are numbers and percentages; ANOVA test was used to compare between means. Mann–Whitney test was used to compare medians.

	Normal T-score	Osteopenia	Osteoporosis	Total	P-value*
Atherogenic Index of Plasma					
Mean (SD)	0.04 (0.2)	0.03 (0.2)	0.02 (0.2)	0.03 (0.2)	0.616
Low risk < 0.1	55 (68.8) [‡]	77 (70.0)	70 (63.6)	202 (67.3)	
Medium risk 0.1–0.24	17 (21.1)	15 (13.6)	23 (20.9)	55 (18.3)	
High risk >0.24	8 (10.0)	18 (16.4)	17 (15.5)	43 (14.3)	
<i>[#]Mean = Geometric mean; SD = standard deviation; [†]Median, Q1-Q3 Interquartile Ranges, [‡]Values are numbers and percentages; ANOVA test was used to compare between means. Mann–Whitney test was used to compare medians.</i>					

Furthermore, nearly half of the postmenopausal women had ≥ 2 risk factors when calculating the CVD risk factors (Table 3). Although there were no significant differences among women, many osteopenic women had one CVD risk factor compared to their counterparts (Table 4).

Table 3
Number of CVD risk factors among postmenopausal women

Number of CVD risk factors [‡]	Normal T-score	Osteopenia	Osteoporosis	Total	P-value*
No risk	8 (10.0) [‡]	11 (10.0)	15 (13.6)	34 (11.3)	0.607
1	28 (35.0)	53 (48.2)	38 (34.5)	119 (39.7)	
2	31 (38.8)	30 (27.3)	30 (27.3)	91 (30.3)	
≥ 3	13 (16.2)	16 (14.5)	27 (24.6)	56 (18.7)	
[‡] Values are numbers and percentages; *P-value is obtained using ANOVA test.					
[‡] CVD risk factors = CVD risk factors include, increase body weight (BMI > 25kg/m ²), serum total cholesterol > 200mg/dL, triglycerides > 150mg/dL, LDL-C > 130mg/dL, and HDL < 40mg/dL.					

Table 4

Spearman correlation between age, anthropometric measurements, and lipids profile among the postmenopausal women.

Normal T-score women (n = 80)								
Variable	Age (years)		BMI (Kg/m ²)		WC (cm)		AIP	
	R	P-value	R	P-value	R	P-value	R	P-value
TC	0.052	0.65	0.125	0.319	-0.133	0.288	-0.218	0.052
TG	-0.087	0.445	-0.056	0.654	-0.101	0.419	0.456	0.000*
LDL-C	0.096	0.395	-0.05	0.689	-0.184	0.138	0.278	0.013*
HDL-C	0.035	0.736	0.048	0.700	0.198	0.112	-0.483	0.000*
AIP	-0.003	0.976	-0.105	0.402	0.218	0.025*	1	-
Osteopenic women (n = 110)								
TC	0.357	0.00*	0.381	0.000*	0.511	0.000*	0.176	0.066
TG	0.191	0.045*	0.225	0.036*	0.390	0.00*	0.532	0.000*
LDL-C	0.362	0.000*	0.228	0.034	0.312	0.003*	0.106	0.269
HDL-C	-0.174	0.068	0.340	0.001*	0.456	0.000*	-0.441	0.000*
AIP	0.029	0.339	0.270	0.011*	0.268	0.012*	1	-
Osteoporotic women (n = 110)								
TC	-0.045	0.639	-0.008	0.938	0.038	0.719	0.230	0.016*
TG	-0.126	0.188	0.040	0.703	0.001	0.996	0.789	0.000*
LDL-C	0.041	0.669	0.091	0.387	-0.021	0.840	0.124	0.197
HDL-C	-0.205	0.032*	0.102	0.334	-0.044	0.679	-0.397	0.000*
AIP	-0.045	0.641	-0.025	0.811	-0.023	0.827	1	-

Among women with normal T-score, AIP correlated positively with WC and LDL-C. Regarding osteopenic women, AIP directly associated with BMI, WC, and TC. Moreover, there was a positive relationship between TC, TG and LDL-C and age. The HDL-C among osteoporotic women decreased significantly with age and AIP (Table 4). The Multiple Linear Regression Model was used to determine the factors affecting the T-score values. The dependent variable entered in the model was T-score value, whereas age, BMI, lipid profile categories, and AIP were the independent variables. Findings revealed that T-score value decreased significantly with age and AIP and increased with BMI (Table 5).

Table 5
Multiple Linear Regression with T-score value as the dependent variable*

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95% CI [#] for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Age	0.028	0.005	0.367	6.173	0.000	0.019	0.037
BMI	-0.022	0.008	-0.168	-2.845	0.005	-0.037	-0.007
TC	0.002	0.001	0.085	1.366	0.173	0.000	0.004
TG	-0.003	0.002	-0.160	-1.663	0.098	-0.007-	0.001
HDL-C	0.006	0.004	0.130	1.597	0.112	-0.002-	0.014
AIP	0.260	0.119	0.221	2.181	0.030	0.025	0.494

*T-score value = refer to having normal T-score, osteopenia, or osteoporosis; [#]CI = Confidence Interval.

Discussion

Osteoporosis is a metabolic disease that mostly affects the elderly and is a major cause of morbidity and mortality [7].

In this research, the prevalence of OP among postmenopausal women was 36.7%. This finding was lower than the prevalence reported in Nigeria (65.8%) [21] and Cameroon (55.8%) [22]. The high prevalence in African countries could be related to the differences in study design, the diagnostic technique used, the bone scan site chosen, and the selection of patients. Contrary to our study, Sudanese women have a higher prevalence of OP compared to their Turkish (16.2%)[23], and Egyptian (28.4%) counterparts[24].

In our study, many women with normal T-scores were obese (based on their BMI and WC) compared to those with osteoporosis and osteopenia. These results are consistent with previous studies done in Chinese population [25–27]. Kim et al., found high body weight and BMI are positively related to high BMD among Korean postmenopausal female (n = 907), aged 60–79 years[28]. Moreover, the prevalence of osteoporosis has been reported to decrease from 45% in underweight to < 1% in obese (BMI > 30) women [29]. The possible explanation to our findings is what has been previously published in the literature where obesity could help sustain bone mineral density by causing a reactive increase in bone formation, mineral density, and an increase in the number of adipocytes [30–32]. Moreover, the large body mass forces a more significant mechanical loading on bone through which the bone mass increases to accommodate this load[33].

Overweight and obesity are associated with increased risk of CVD but considered protective against osteoporosis[30]. Study revealed that more than half more of the women were obese, and 86.4% suffered

from central obesity. Our study revealed no significant difference among the study groups regarding the TG, HDL-C, LDL-C and TC levels. This is in accordance with previous findings, which stated that osteoporosis does not affect the lipid profile [34].

Other studies have looked into the connection between lipid profile and BMD, but the findings are conflicting. The negative association has been supported by several studies [27, 30–33, 35]. Other studies have found no connection between serum lipids and BMD[36–39]. Solomon and coworkers found no associations between serum lipid profile and BMD among osteoporotic men and women (n = 13,592) [36]. Moreover, Adami and colleagues found no significant association between elevated serum LDL-C, TG, TC, and BMD among women aged 68–75 years[39]. Also, our study revealed that dyslipidemia is very common among women. Overall, 25% (n = 300 women) had hypercholesterolemia and hypertriglyceridemia, whereas more than 75% had low HDL-C levels. Dyslipidemia is highly associated with an increased risk of CVD.

In our study, BMI associated positively with TC and TG and negatively with HDL-C. These findings might explain the high prevalence of dyslipidemia among osteopenic women. Moreover, as osteopenic women increase in age, their TC, TG, LDL-C increased, whereas HDL-C decreased with age among the osteoporotic women. Lipid disorders have been associated with low bone mineral density in some studies [35, 38]. The mechanism of this relation may be directly related with the cholesterol biosynthetic pathway, which determines cholesterol levels and contributes to the activity of the osteoclast[40].

Furthermore, there were no significant differences among women in their AIP values. Overall, 33% (n = 300) had elevated AIP levels. The AIP levels among osteoporotic women correlated positively with TC, and among the normal T-score women, AIP associated with elevated LDL-C. Previous studies reported that atherosclerotic vascular disease is more prevalent among women with osteoporosis and osteopenia than those with normal BMD[41, 42].

The current study raised that concern about the risk of CVD among osteoporotic Sudanese women. More studies should focus on women aged > 47 years because our findings highlighted a high prevalence of osteoporosis, dyslipidemia, and obesity, all considered risk factors for CVD.

The current study has several strong points. It is the first published study that assessed the risk of CVD among osteoporotic women. Second, it focused on the classical risk factors, namely dyslipidemia and obesity. Our study could serve as a baseline for subsequent studies. However, the cross-sectional study design does not reflect the accurate estimates of relationships between osteoporosis and CVD. The study did not include repeated blood samples, and only one sample was drawn, which increases inter-personal variation error.

Conclusion

Osteoporosis is prevalent among Sudanese postmenopausal women who are also at increased risk for CVD. Necessary steps are needed for public education and wider dissemination of information about

osteoporosis, CVD risk and their prevention.

Abbreviations

OP: osteoporosis; AIP: atherogenic index of plasma; BMI: body mass index; WC: waist circumference; CI: confidence interval; HDL-C: high-density lipoproteins cholesterol; LDL-C: low-density lipoproteins cholesterol; TC: total cholesterol; TG: triglycerides.

Declarations

Ethics Approval and Consent of participate

Ethical approval was obtained before the start of the study from the Deanship of Scientific Research at the Sudan University of Science and Technology (NO: DSR-IEC-03-08). All the procedures used in this study met the current revision of the Helsinki Declaration. The study protocol was explained to women before the start of the study. All women provided a signed consent before the start of the study.

Consent for publication

Not applicable.

Availability of data and material:

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare no conflict of interest.

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Authors'contributions

AE, GhAE, ABE, and HNA conceived and designed the study. AIH, and MA recruited the participants, collected the data and performed the biochemical assays. AE, ABE, and GhAE analyzed and interpreted the data, and drafted the manuscript. AE, ABE, GhAE, AIH, MA, HNA, and ABE, and critically revised the manuscript. All the authors approved the final manuscript.

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Author details.

¹Department of Clinical Chemistry, College of Medical Laboratory Science, Sudan University of Science and Technology, P.O.Box 407 Khartoum, Sudan. ²Faculty of Medicine, National Ribat University, Khartoum, Sudan. ³Department of Biochemistry, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia. ⁴Clinical Nutrition Department, Taibah University, Saudi Arabia.

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