

Peer Review File

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Reviewer A

The retrospective study is interesting and the article is quite well written, however the references are redundant, disorganized and often not correctly related to the text. References and article form require an accurate revision.

In order to improve your article, I suggest the following changes to the manuscript:

Comment 1) Please change or eliminate reference 3, 5, 6, 9 and 14. They are not related to the topic of your article or not related to the sentence where they are reported.

Reply1: Thank you for your suggestion. We have deleted all these references.

Changes in the text: Deleted all these references 3, 5, 6, 9 and 14.

Comment 2) The sentence “heart failure is a syndrome..” should be well written and explained

Reply2: Thank you for your careful consideration and constructive suggestions. Thank you for the kind reminder. We have explained the sentence mentioned below. Heart failure is a complex clinical syndrome caused by abnormal changes in the structure and function of the heart due to a variety of causes, resulting in dysfunction of ventricular contraction or diastolic function, mainly manifested as dyspnea, decreased exercise tolerance, and fluid retention including pulmonary congestion, systemic congestion and peripheral edema, which is the terminal stage of common clinical heart diseases.

Changes in the text: Heart failure is a complex clinical syndrome caused by abnormal changes in the structure and function of the heart due to a variety of causes, resulting in dysfunction of ventricular contraction or diastolic function, mainly manifested as dyspnea, decreased exercise tolerance, and fluid retention including pulmonary congestion, systemic congestion and peripheral edema, which is the terminal stage of common clinical heart diseases.

Comment 3) Please modify reference n. 2 with “Baman JR, Passman RS. Atrial Fibrillation. JAMA. 2021; 325(21):2218”

Reply3: Thank you for your careful consideration and constructive suggestions for improving our paper. We have modified reference n. 2 with “Baman JR, Passman RS. Atrial Fibrillation. JAMA. 2021; 325(21):2218”.

Changes in the text: Baman JR, Passman RS. Atrial Fibrillation. JAMA. 2021; 325(21):2218

Comment 4) Reformulated the sentence “Studies have shown that the annual incidence

of heart failure in patients with AF is about 37% (4,5) and (6,7) that it is associated with worse outcomes”. It should be well written and explain

Reply4: Thank you for your careful consideration and constructive suggestions for improving our paper. We have reformulated the sentence above to the revised manuscript. In addition, the occurrence of heart failure following atrial fibrillation (AF) was markedly associated with worse clinical outcomes in terms of morbidity and mortality. Studies have shown that 37% of people with AF had heart failure. Moreover, people with AF have a nearly 2-5folds increased risk of HF.

Changes in the text: In addition, the occurrence of heart failure following atrial fibrillation (AF) was markedly associated with worse clinical outcomes in terms of morbidity and mortality. Studies have shown that 37% of people with AF had heart failure. Moreover, people with AF have a nearly 2-5folds increased risk of HF.

Comment 5) In the sentence “Limited recent studies” add the references

Reply5: Thank you for your careful consideration of and constructive suggestions. We have added the related references.

Changes in the text: We added 2 references.

10. Wang W, Tan JS, Wang J, et al. Genetically predicted waist circumference and risk of atrial fibrillation. *Chin Med J (Engl)*. 2024 Jan 5;137(1):82-86.

11. Poorthuis MHF, Sherliker P, de Borst GJ, et al. Joint Associations between body mass index and Waist Circumference with Atrial Fibrillation in men and women. *J Am Heart Assoc*. 2021 Apr 20;10(8): e019025-29.

Comment 6) Reformulated the sentence “This imbalance will lead to the accumulation of excess fat in the body, which is manifested as a systemic dysfunction of weight control...”

Reply6: Thank you for your careful consideration of and constructive suggestions. We have reformulated the sentence. Obesity is a multifactorial disease, which is caused by the imbalance between energy intake (EI) and total energy expenditure (TEE). [1, 2]. This imbalance will lead to the accumulation of excess fat in the body and is related to changes in many metabolic pathways.

Changes in the text: Obesity is a multifactorial disease, which is caused by the imbalance between energy intake (EI) and total energy expenditure (TEE). [1, 2]. This imbalance will lead to the accumulation of excess fat in the body and is related to changes in many metabolic pathways.

Comment 7) Ref. 21. According to the analysis of existing evidence, we found that the risk of CVD is related to abdominal obesity. The risk of CVD rose continually with the

increase of WC, WHR and WHtR when they exceeded a certain range. Keep your WC to less than half your height could help reduce the risk of CVD. As simple and useful indicators of abdominal obesity, WC, WHR and WHtR, especially WHtR, are worth to popularise in future study and clinical application to help prevent CVD.

Reply7: Thank you for your questions and suggestions. Thank you for the kind reminder.

Changes in the text: no changes.

Comment 8) The conclusion of the article cited as reference 30 is “the currently recommended cutoff for WC of 102 cm for men may need to be reevaluated; a lower cutoff may be more appropriate”, but you reported to corroborate your sentence “WC >102 cm for males and WC >88 cm for females to evaluate the increased risk of heart metabolic disease”. I think you got the wrong sentences to cite this quote.

Reply8: Thank you for your careful consideration and constructive suggestions for improving our paper. We have corrected the reference to the revised manuscript.

Changes in the text: We added this reference.

National Institutes of Health, National Heart, Lung, and Blood Institute. North American Association for the Study of Obesity. The practical guide: identification, evaluation, and treatment of overweight and obesity in adults. NIH Publication 2000;00-4084

Comment 9) Ref. 31 refers to probiotics using in patients with type 2 diabetes and not affected by atrial fibrillation. I don't understand the relationship between this article and the topic of your article.

Reply9: Thank you for your careful consideration and constructive suggestions for improving our paper. I have deleted the reference.

Changes in the text: I have deleted the reference 31.

Reviewer B

This manuscript focused on the association between waist circumference (WC) and heart failure (HF) in patients with non-valvular atrial fibrillation (NVAf). Authors calculated odds ratios of WC (as a continuous variable and categorical variable) and central obesity (CO) for the presence of HF in patients with NVAf. Then, authors demonstrated that both WC and OC were significantly associated with HF. As authors mentioned, an increased WC and OC are known to be risk factors for the development of AF. Therefore, the concept of this study is understandable. However, the methodology of this study seems inappropriate for this purpose. Authors may want to

consider several concerns as follows.

Major comments

Comment 1) It is difficult to know what was the main focus of this study. Since all subjects had NVAF, the association between WC and AF cannot be evaluated. Objective variable of this study is actually only the presence of HF.

Reply1: Thank you for your questions and suggestions. Our main purpose was to study the relationship between WC, central obesity (CO), and NVAF patients with heart failure. Since subjects in this study all had NVAF, the objective variable of this study is heart failure in the patients with NAVF.

Changes in the text: no changes.

Comment 2) In relation to above, if authors wanted to investigate the influence of WC and OC on the incidence of AF, new-onset AF should be observed during the index observation period in subjects without AF at baseline by the WC levels or OC presence.

Reply2: Thank you for your constructive suggestions for improving our paper. The study focused on the correlation between WC and heart failure in the patients with NAVF, so we did not observe new-onset AF in the baseline.

Changes in the text: no changes.

Comment 3) Furthermore, since this study was cross-sectional fashion, WC or OC cannot predict the incidence of AF or HF. The present results demonstrated only association between WC or OC and the presence of HF.

Reply3: Thank you for your questions and suggestions. We have corrected the concept: Our study has revealed the association between WC or OC and the presence of HF in the patients with NYAF.

Changes in the text: Our study has revealed the association between WC or OC and the presence of HF in the patients with NYAF.

Minor comments

Comment 4) The current title does not express the contents of this study.

Reply4: Thank you for your questions and suggestions. We have corrected the title in the manuscript: Associations between waist circumference, central obesity, and the presence of non-valvular atrial fibrillation patients with heart failure

Changes in the text: Associations between waist circumference, central obesity, and the presence of non-valvular atrial fibrillation patients with heart failure.

Comment 5) Abbreviations in Key findings should be spelt out at the first time of use.

Reply5: Thank you for your careful consideration of and constructive suggestions. We have spell out the abbreviations in Key findings at the first time of use.

Changes in the text: We modified it non-valvular atrial fibrillation (NVAF) patients

Comment 6) Figures 2B and 3 seem out of the study focus.

Reply6: Thank you for your careful consideration of and constructive suggestions. In Figure 2B, we revealed that WC has the higher value in predicting the risk of cardiovascular diseases, compared with general obesity evaluation indicator BMI. In Figures 3, we revealed that the diagnostic value of WC for NVAF with heart failure was higher for females than it was for males.

Changes in the text: no changes.

Reviewer C

1. Please revise ‘historical’ and ‘historic’ to ‘retrospective’.

56 **Methods:** This is a historical cohort study. A total of 3,435 patients with NVAF in
57 First Affiliated Hospital of Xinjiang Medical University from January 201:
108 **##Participants**
109 This is a historic cohort study based on the database of Shang et al. (6), which was
110 conducted from January 2015 to December 2017 and included 3,435 NVAF patients at

Reply: Thank you for your careful consideration of and constructive suggestions for improving our paper. We apologize for our negligence. We have revised ‘historical’ and ‘historic’ to ‘retrospective’.

Changes in the text: We have revised ‘historical’ and ‘historic’ to ‘retrospective’.

2. Please give a reference of “Shang et al.” study in this sentence.

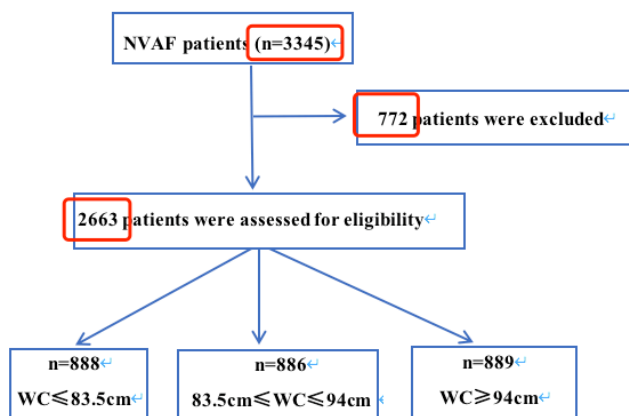
115 **##Participants**
116 This is a historic cohort study based on the database of Shang et al. which was
117 conducted from January 2015 to December 2017 and included 3,435 NVAF patients at
118 the First Affiliated Hospital of Xinjiang Medical University. After excluding 772

Reply: Thank you for your careful consideration of and constructive suggestions. We have added the related reference.

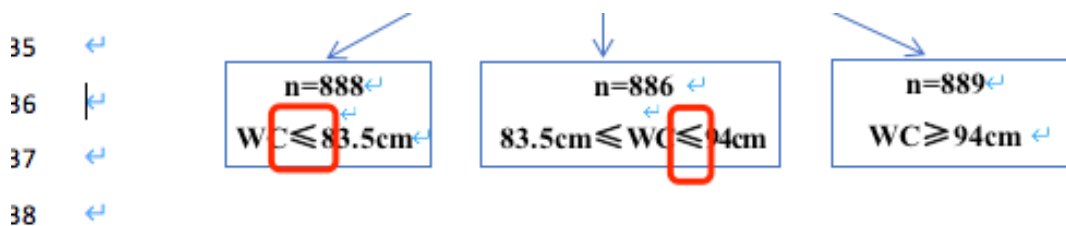
Changes in the text: We have added reference 12.

3. Figure 1

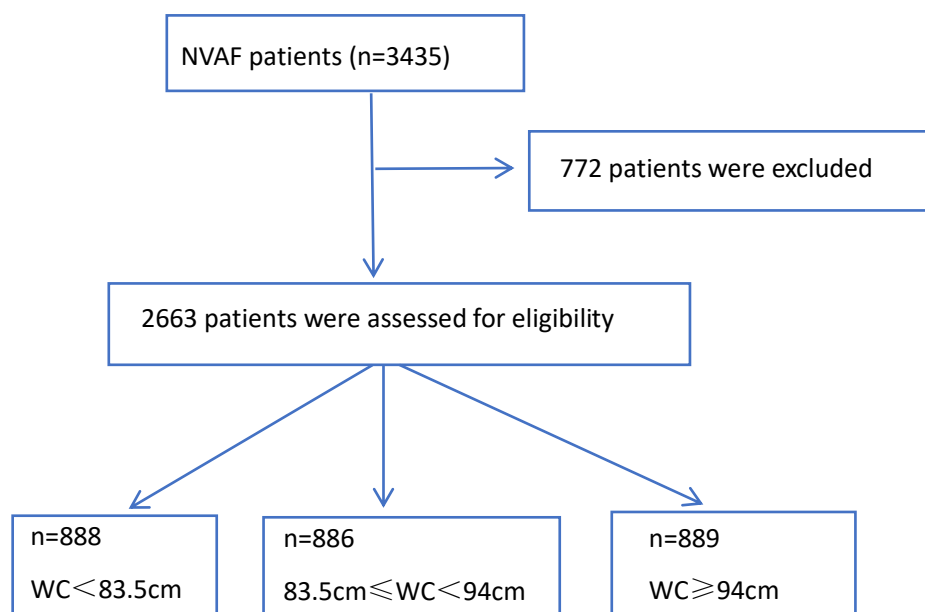
a. Please double-check the accuracy of the data in figure 1. 3345 minus 772 is 2573, not 2663. Please revise.



b. Please revise the symbol. $WC < 83.5$, $WC < 94$.



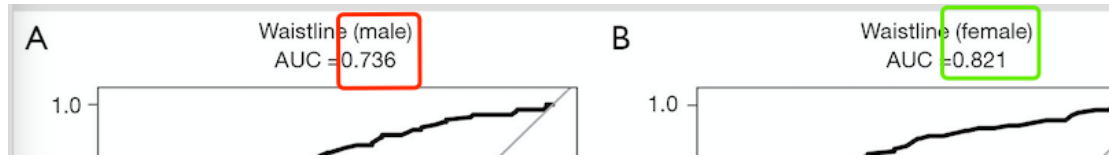
Reply: Thank you for your careful consideration of and constructive suggestions. We have revised the data and the symbol in figure 1.



4. Figure 3

Please check if the description matches the figure 3.

224 The diagnostic value of WC for NVAf with heart failure was higher for males than it
 225 was for females and its AUC is larger (0.821:0.736) (Figure 3).



Reply: Thank you for your careful consideration of and constructive suggestions. We

have reformulated the description matches the figure 3: The diagnostic value of WC for NVAf with heart failure was higher for females than it was for males and its AUC is larger (0.821:0.736) (Figure 3).

Changes in the text: We have changed “The diagnostic value of WC for NVAf with heart failure was higher for females than it was for males and its AUC is larger (0.821:0.736) (Figure 3).”

5. Tables 1, 2

How were these data presented in your Table? mean±SD? mean±SEM? Please give explanations inside Table.

	47 (4.7%)	55 (5.5%)	402 (40.2%)
Age, year	62.5±9.9	63.2±9.9	64.2±9.0
Male, n (%)	292 (32.9)	358 (40.4)	389 (43.8)
Female, n (%)	596 (67.1)	528 (59.6)	500 (56.2)
Education level, n (%)			
Primary school and below	470 (52.9)	480 (54.2)	519 (58.4)
Middle school	250 (28.2)	266 (30.0)	248 (27.9)
High school or higher	168 (18.9)	140 (15.8)	122 (13.7)
Current smoking, n (%)	158 (17.8)	163 (18.4)	137 (15.4)
Current drinking, n (%)	764 (86.0)	747 (84.3)	743 (83.6)
Height, cm	160.7±10.4	162.3±9.1	163.1±8.5
SBP, mmHg	137.8±19.5	143.4±21.0	147.7±22.1
DBP, mmHg	83.2±11.3	86.0±12.3	86.3±12.6
FBG, mmol/L	5.8±1.7	6.1±2.1	6.3±2.1
TG, mmol/L	1.5±0.9	1.7±1.1	2.0±1.3
TC, mmol/L	4.9±1.1	5.0±1.2	5.1±1.2
LDL-C, mmol/L	2.9±1.0	3.0±0.9	3.1±1.0
HCY, mmol/L	12.6±8.8	16.0±10.7	16.3±8.9
Blood glucose (%)	411 (46.2)	475 (53.6)	467 (52.5)

Table 2 The univariate analysis of NVAf with heart

Variable	With heart failure
Age, year	63.3±9.6
Male, n (%)	1,039 (39.0)
Female, n (%)	1,624 (61.0)
Education level, n (%)	
Primary school and below	1,469 (55.2)
Middle school	764 (28.7)
High school or higher	430 (16.1)
Current smoking, n (%)	458 (17.2)
Current drinking, n (%)	2,254 (84.6)
Height, cm	162.0±9.4
WC, cm	88.5±11.7
CO, n (%)	1,530 (57.5)
SBP, mmHg	142.9±21.3
DBP, mmHg	85.2±12.2
FBG, mmol/L	6.1±2.0
HCY, mmol/L	15.0±9.6
TG, mmol/L	1.7±1.1
TC, mmol/L	5.0±1.2
LDLC, mmol/L	3.0±1.0
Plaque, n (%)	1,353 (50.8)

Reply: Thank you for your careful consideration of and constructive suggestions for improving our paper. We have added “mean±SD” in this Table.
Changes in the text: We have added “mean±SD” in this Table.

6. References

a. Citation of reference 18 is missing in the main text. Please check and revise. Reference 18 should be cited consecutively between 17 and 19.

242 metabolic pathways (17). Previous studies have shown that the 1-year mortality risk of
243 AF patients was negatively related to high BMI, and was directly related to the presence
244 of chronic kidney disease, carotid stenosis, and chronic heart failure in the cohort of AF
245 patients (-19). In underweight and normal-weight Asian populations, BMI variability,
246 particularly weight gain, has been associated with an increased risk of new-onset AF

b. There are totally 28 references in the reference list, but only 27 citations in the main text. Please check and revise.

Reply: Thank you for your careful consideration of and constructive suggestions for improving our paper. I have revised the related references.
Changes in the text: We have added reference 18, 19, 20.

c. The authors mentioned “studies...”, while only one reference was cited. Change “Studies” to “A study” or add more citations. Please revise. Please number references consecutively in the order in which they are first mentioned in the text.

Studies have shown that 37% of people with AF had heart failure. Moreover, people with AF have a nearly 2-5 folds increased risk of HF(4).

Previous *studies* have shown that the 1-year mortality risk of AF patients was negatively related to high BMI, and was directly related to the presence of chronic kidney disease, carotid stenosis, and chronic heart failure in the cohort of AF patients (-19).

Reply: Thank you for your questions and suggestions. We have changed “Studies” to “A study”.

Changes in the text: We have changed “Studies” to “A study”.

7. Should “116” be “16”? Please check.

194 consumption, DBP, TC ($P>0.05$). In the analysis using baseline clinical characteristics (Table 1) and
195 the univariate analysis (Table 2), we found a clear positive correlation between both WC and CO
196 and NVAf with heart failure. According to the WHO's criteria, we classified WC into a dichotomous
197 variable (≥ 94 cm for men and ≥ 80 cm for women) which we called CO (116). In the non-adjusted

Reply: Thank you for your questions and suggestions. We have revised “116” to “16”.

8. **Table 3:** FGB or FBG? Which one is correct? Please check and revise.

493 adjusted model adjusted for age, sex, education, smoking, drink, height, systolic, diastolic, FGB,
494 HCY, TG, TC, LDLC and complications such as heart failure, hypertension, DM, stroke, vascular
531 fibrillation; OR, odds ratio; CI, confidence interval; FBG, fasting blood glucose; HCY, homocysteine;

Reply: Thank you for your careful consideration and constructive suggestions for improving our paper. We have checked and revised “FGB” to “FBG”.