Iranian Journal of Radiology
Volume 19 · Issue 3 · e123693

OPEN PEER REVIEW

Evaluation of the Advantages of Myocardial Blood Flow Index in the Diagnosis of Chronic Obstructive Coronary Artery Disease Versus Coronary Computed Tomography Angiography: A Feasibility Study

Qing-Feng Xiong, Guang-Yao Wu, Xiao-Rong Fu, Di Zhou, Sheng-Peng Guo

SUBMITTED	REVISED	ACCEPTED	DOI
9 Mar 2022	7 Oct 2022	11 Oct 2022	10.5812/iranjradiol-123693

About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

More about open peer review: brieflands.com/knowledgebase/opr

Contents

1 **Original submission** 2
2 **Revision 1** Editor-in-Chief 3
Authors' reply to reviewers 4
Reviewer and editor comments 5
3 **Revision 2** Editor-in-Chief 6
Authors' reply to reviewers 7
Reviewer and editor comments 8
4 **Revision 3** Referee 1, Referee 2, Editor-in-Chief 9
Authors' reply to reviewers 10
Reviewer and editor comments 16
5 **Revision 4** Editor-in-Chief 17
Authors' reply to reviewers 18
Reviewer and editor comments 19
6 **Revision 5** Editor-in-Chief 20
Authors' reply to reviewers 21
Reviewer and editor comments 24

1 Original submission

0 comments

No public comments in this round.

2

Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Replying one by one

1. Please clarify the financial resource and mention the grant number with the link address or upload official approval grant number.

Reply: Thank you! We have uploaded the official approval document.

2. Regarding the importance of “conflict of interest” clarification, corresponding author should fill the “ICMJE form” form and upload in the submission process.

Reply: Thank you! We have filled the “ICMJE form” form and uploaded in the submission process.

3. Figure (2) is not mentioned in the text correctly (or you have forgotten to mention one or more tables in the article body). Please, mention all Figures in the text consecutively.

Reply: Thank you! We have checked all Figures in the text consecutively.

4. You need to highlight any change in your word file.

Reply: Thank you! We have highlighted all changes in the word file.

2 Revision 1

1 comment · 28 Mar 2022

Editor-in-Chief

MINOR REVISION 28 Mar 2022

Dear authors,
Given the importance of “conflict of interest” clarification, the corresponding author should fill out the “ICMJE form” and upload it during the submission process. (The form is available in the “conflict of interest” section of the site:
https://brief.land/iranjradiol/knowledgebase/category/tree.html#conflicts_of_interest.html).
Regards

3

Revision 2

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Replying one by one

1. The corresponding author should fill the “ICMJE form” form and upload in the submission process.
Reply: Thank you! We have uploaded the “ICMJE form”.

2. The authors should state Funding/Support on the journal website. The grant number or Funding does not have any webpage. Please write the webpage which is related to your research project.
Reply: Thank you! We have written the webpage which is related to our research project.

3. The authors should state an Ethical Approval Code with a direct link.
Reply: Thank you! We have stated the Ethical Approval Code with a direct link.

3 Revision 2

1 comment · 7 May 2022

Editor-in-Chief

MAJOR REVISION 7 May 2022

Dear authors,
Your article needs Major Revision.
Regards

4

Revision 3

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Replying one by one

Reviewer 1:

1. The study was about comparing the accuracy of CCTA and MBFI for evaluation of the significant coronary artery stenosis in patients with CAD. But this comparing is not notified in manuscript title..

Reply: Thank you! The comparing has been notified in the manuscript title.

2. What is the definition for chronic obstructive coronary artery disease? Do you mean stable angina? If you mean stable angina, why the images which are included in manuscript are the patients with unstable angina?

Reply: Thank you! Chronic obstructive coronary artery disease is relative to acute obstructive coronary artery disease. It reflects a chronic pathological process of subepicardial coronary plaque. With the development of the disease, it may also progress to unstable angina pectoris. When there is no clinical evidence of myocardial injury for ischemia, angina pectoris caused by this chronic stenosis is often diagnosed as stable angina pectoris. Limited by the means of evaluating myocardial injury or lack of clinical experience, these clinical indicators suggesting myocardial injury sometimes appear false negative, but in fact, this kind of stable angina pectoris has progressed.

Chronic Obstructive Coronary Artery Disease

Dean J. Kereiakes, MD, FACC

The Christ Hospital Heart and Vascular Center/The Carl and Edyth Lindner Center for Research and Education at The Christ Hospital, Cincinnati, OH

[Rev Cardiovasc Med. *2009;10(suppl 2):S1-S2 doi: 10.3909/ricm10S20001*]

© 2009 MedReviews®, LLC

3. In the objective section of manuscript the aim of study is not clear and it’s better to be clarified.

Reply: Thank you! In the objective section of manuscript the aim of study has been rectified.

4. The formula which is used in this study for calculation of MBFI should be explained in method section. The logic of this formula and the added parameters is not clear. In method section it is not necessary to explain the calculating method of CTDIvol or DLP but it is necessary to explain the calculating formula for MBFI and to explain how this formula works.

Reply: Thank you! An explanation of the formula has been supplemented in method section, and the calculating method of CTDIvol or DLP has been removed.

5. In this study you consider the most severe stenotic lesion of coronary arteries as the CCTA information but you compare it with total MBFI which is influenced by all coronary arteries and their lesions with different degrees of stenosis so this comparison is not logical.

Reply: Thank you! According to the degree of epicardial coronary artery stenosis, the method of CCTA can diagnose coronary artery disease. MBFI is a functional index reflecting the degree of myocardial ischemia in patients with chronic obstructive coronary artery disease. The two methods are closely related, just as the method of coronary angiography evaluates coronary artery stenosis and fractional flow reserve reflects the severity of myocardial ischemia caused by stenosis. Therefore, CCTA and MBFI are comparable.

Reviewer 2:

1. There are some grammatical points to be rectified.

Reply: Thank you! The grammatical points has been rectified.

2. Many abbreviations and acronyms are not spelled out in their first appearance in the main text, like CAD, FFR, PCI, BMI, and ICA. These words must be spelled out in their first use.

Reply: Thank you! The abbreviations and acronyms have been spelled out in their first appearance in the main text, including CAD, FFR, PCI, BMI, and ICA.

3. There is a statement in the “Introduction” section as: "For CAD, myocardial ischemia is an important indicator, which is the primary evidence for PCI, and is also the internal power of myocardial remodeling (6-7).” Please clarify the definition of “internal power” in this statement.

Reply: Thank you! “internal power” refers to “inducing”. It has been corrected in the text.

4. The experience duration of interventional cardiologists is not mentioned.

Reply: Thank you! The experience duration of interventional cardiologists has been added.

5. Please explain the statement: “Using ICA stenosis ≥ 70% as the gold standard, the diagnostic test was performed. If the MBFI ≤ the optimal cut-off value, the lesions were considered severe, and if the CCTA stenosis ≥ 70% (Diameter narrowing), the lesions were considered severe.”, more clearly, specifically, and explicitly.

Reply: Thank you! The section has been rectified.

Using ICA (greater than or equal to 70% stenosis) as the gold standard, the diagnostic test of MBFI or CCTA was performed. If the value of MBFI conforms to less than or equal to the optimal cut-off value, the lesion of coronary artery was considered severe. Similarly, if CCTA conforms to greater than or equal to 70% stenosis (Diameter narrowing), the lesion was considered severe.

6. The average scan dose of CCTA has been mentioned to be 3.02±1.15 mSv in the “Results” section of the text, while it has been stated to be 3.17±1.02 mSv in Table 1. Please clarify the difference.

Reply: Thank you! It should be 3.02±1.15 mSv. It has been rectified in Table 1.

7. Please determine the reason to exclude patients younger than 30 and older than 75 years old in this research.

Reply: Thank you! In this research, the process of myocardial ischemia caused by chronic coronary artery stenosis and myocardial remodeling is relatively long. For young patients with coronary artery disease, due to the short course of disease, myocardial remodeling may not be obvious, while for elderly patients, the interference of age factors is more obvious. Therefore, young patients younger than 30 years old and elderly patients older than 70 years old were excluded.

8. In Table 1, the total number of patients, based on their invasive coronary artery angiography (ICA) results would be 69 (33+21+14+1), while the total number of enrolled patients in this study was stated to be 68, in the main text.

Reply: Thank you! The total number of patients is 68, three-vessel diameter stenosis is actually multi-vessel diameter stenosis, and the multi-vessel diameter stenosis include the left main lesion with three-vessel diameter stenosis. Thanks!

9. In Figure 5, the patient's MBFI is mentioned to be 0.128, and accordingly, the patient is regarded to have severe stenosis. Please double-check if the legend provides the correct definition.

Reply: Thank you! the patient's CCTA is suspected severe stenosis, but ICA images showed a gentle lesion with 10% diameter stenosis (arrow), and MBFI was 0.128, which implies the lesions with not severe stenosis.

It has been rectified in Figure 5.

10. The limitations of the study are expected to be mentioned.

Reply: Thank you! The limitations of the study has been mentioned.

Reviewer 3:

1. I recommend that you have their manuscript to be read through by a native English

editing service. There are some obvious grammatical and writing mistakes.
Reply: Thank you! The manuscript has been checked by a native English editing service.

2. The study's objective should be explained not only precisely but also clearly. It is vague and brief. You have compared the two methods, but we do not see anything about this in the objectives section.
Reply: Thank you! The study's objective has been rectified.

3. Thanks for the thorough description of the CT imaging method. Please provide the name and slice number of the CT equipment. It is Siemens, but which of them? (somatom definition Flash, somatom Force,...).
Reply: Thank you! We have provided the name and slice number of the CT equipment.

4. The discussion section is too short and does not include a thorough interpretation of the research results. You should explain the advantages of the CCTA in 2-3 paragraphs. Then, you should explain physical examination and observational measures of CAD (such as MBFI) in 2-3 sections and explain the presently available data about this in the literature. Finally, compare them with attention to your study and previous research in the literature.
Reply: Thank you! The discussion section has been supplemented carefully.

5. There must be explanations of the study limitations.
Reply: Thank you! The limitations of the study has been mentioned.

Reviewer 3:

1. The results of ROC analysis of the two methods (MBFI and CTCA) should be presented in a table with 95% confidence intervals.

Reply: Thank you! The results of ROC analysis of the two methods (MBFI and CTCA) have been presented in a table with 95% confidence intervals.

2. There is a similar study entitled "Combined assessment of subtended myocardial volume and myocardial blood flow for diagnosis of obstructive coronary artery disease using cardiac computed tomography: A feasibility study" in this field that can be used to improve the results presenting and writing style.
Reply: Thank you! The results presenting and writing style have been improved.

3. Each word must be written in full form in the abstract and in the full text, as CCTA in line 19.
Reply: Thank you! Each word has been written in full form in the abstract and in the full text.

4. The word" between" in line 30 should be changed to "and".
Reply: Thank you! The word" between" in line 30 has been changed to "and".

4 Revision 3

3 comments · 11 Jul 2022 – 28 Jul 2022

Referee 1 Reviewer

MINOR REVISION 11 Jul 2022

Currently, this manuscript has been appropriately edited, but it would be better if, in table 2, in addition to the AUC, which was reported with 95% confidence intervals indicating non-overlap between the two methods and a significant difference in diagnosis, other indicators such as sensitivity, specificity, and positive and negative predictive values were also reported with 95% confidence intervals. In addition, a column should be included for accuracy, and a row should be added to the table to compare the significance level of the two methods.

Referee 2 Reviewer

MAJOR REVISION 27 Jul 2022

Here are my recommendations for the authors.
1. The section describing the formula for the calculation of MBFI is still vague and complex. Please paraphrase this part in a more explicit form.
2. The manuscript still contains errors in written English. Please refer the manuscript to an expert in academic English writing. An essential point in this regard is to avoid complex sentences, which are a problem in this manuscript.
3. The discussion is still insufficient. It is inappropriate in this form. Explain the advantages of CCTA in 2-3 paragraphs. Then, explain physical examination and observational measures of CAD (such as MBFI) in 2-3 sections, along with the data presently available in the literature. Finally, compare them with attention to the present study and previous research in the literature. Please compare the related studies clearly and one by one.
Best Wishes!66

Editor-in-Chief

MAJOR REVISION 28 Jul 2022

Dear authors,
Your article needs Major Revision.
Regards

5

Revision 4

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Replying one by one

Reviewer 1:

1. The section describing the formula for the calculation of MBFI is still vague and complex. Please paraphrase this part in a more explicit form.

Reply: Thank you! The section describing the formula for the calculation of MBFI has been interpreted in a more explicit form.

2. The manuscript still suffers mistakes in English writing. Please refer the manuscript to an expert in academic English writing. An essential point in this regard is avoiding complex sentences, which is a problem in this manuscript.

Reply: Thank you! The manuscript has been checked carefully in English writing.

3. The discussion is still insufficient. It is inappropriate in this form. Explain the advantages of the CCTA in 2-3 paragraphs. Then, explain physical examination and observational measures of CAD (such as MBFI) in 2-3 sections and the presently available data in the literature. Finally, compare them with attention to the present study and previous research in the literature. Please compare the related studies clearly and one by one.

Reply: Thank you! The discussion has been rectified in an appropriate form.

Reviewer 2:

Reply: Thank you! 95% confidence intervals of sensitivity, specificity, positive and negative predictive value have been added, and the accuracy has been also added to the table to compare the significance level of the two methods.

5 Revision 4

1 comment · 2 Oct 2022

Editor-in-Chief

MINOR REVISION 2 Oct 2022

Dear authors,
Your article needs Minor Revision.
Regards

6

Revision 5

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Replying one by one

Reviewer 1:

Table 2 is not cited in the manuscript. Please cite it.
Reply: Thank you! Table 2 has been cited in the manuscript.

Associate Editor's Comments:

1-there are some abbreviations in title that make it vague. Please use full terms instead of abbreviations.

Reply: Thank you! The abbreviations in title have been replaced by the full terms.

2-the authors mentioned in line 24: “The receiver operating characteristic (ROC) curve characteristics and diagnostic accuracy were evaluated” it seems better as: “Diagnostic accuracy of variables were assessed by receiver operating characteristic (ROC) curve.”

Reply: Thank you! The sentence has been replaced.

3-please add full term off abbreviations in abstract and text separately when you use them for the first time [for example, CAD in line 42, CCTA in line 54, AUC, ……]

Reply: Thank you! The abbreviations have been added the full terms.

4-in line 58, please correct: “Inclusion criteria were as followed:”

Reply: Thank you! It has been corrected.

5-please denote on figure 1 the “Exclusion Conditions” on the horizontal arrows below boxes [showing all of the exclusions]

Reply: Thank you! All exclusion conditions have been denoted.

6-it is better the authors introduce abbreviations in figure 1 such as STEMI, BMI, …. [could be written in legend or below the figure box]

Reply: Thank you! The notes have written below the figure box.

7-the authors mentioned [lines 88 and 114]: “they were consensus through consultation” this is vague. [may be: they reached consensus through consultation???]

Reply: Thank you! They have been corrected.

8-in line 107, is the MBI in formula BMI?

Reply: Thank you! BMI is body mass index.

9-in figure 2, it is better the authors add space between “pressure” and “of” [below P1 and P0]

Reply: Thank you! They have been corrected.

10-please add abbreviations in table footnote: ICA, CCTA, MBFI, COV, CI, CAD, ROC, AUC, ….

Reply: Thank you! The table footnote has been added.

11-please correct Chinese character in table 2 [probably, it is P value]

Reply: Thank you! Yes, it is P value.

12-in lines 134 and 135, the authors mentioned: “The sensitivity, specificity, positive predictive value of MBFI were” that is wrong. I think it should be: “The sensitivity, specificity, positive predictive value and negative predictive value of MBFI were”

Reply: Thank you! The phrase of negative predictive value has been added.

13-what is the meaning of “and it is short of function parameters”?

Reply: Thank you! The sentence has been corrected. It can’t evaluate whether the lesions of coronary artery possess hemodynamic significance.

14-please cite table 2 in text.

Reply: Thank you! table 2 has been cited in text.

15-this sentence is unclear: “If the diameter stenosis of ≥ 70% was used, it was usually combined with other indexes (19, 29-30).”

Reply: Thank you! If the diameter stenosis is ≥ 70%, it was usually implied the possibility of ischemic myocardium. In order to confirm the possibility, CCTA prefer to combine with other indexes.

16-please replace Limitation with: current study has some limitations.

Reply: Thank you! It has been replaced.

17-this sentence is unclear: “It is retrospective research and needs a large sample prospective study to demonstrate the advantage” better version could be: “current study is retrospective and a prospective study with larger sample size is better for demonstration of MBFI advantages.

Reply: Thank you! The sentence has been corrected.

18-Figure 4 and 5 legends could be written better as: “A 68-year-old male patient with unstable angina; Imaging findings of left anterior descending (LAD) artery.” And “A 71-year-old male patient with unstable angina; Imaging findings of left anterior descending (LAD) artery.”

Reply: Thank you! Figure 4 and 5 legends have been corrected.

19-in figures 4 and 5 legends, images are better to be written as image.

Reply: Thank you! “images” has been replaced by “image”.

6 Revision 5

1 comment · 11 Oct 2022

Editor-in-Chief

ACCEPT 11 Oct 2022

Dear authors,
Your article is acceptable for publication in IJR.
Regards