Reviewer’s report

Title: Dual energy CT findings in gout with rapid kilovoltage-switching source with gemstone scintillator detector

Version: 0 Date: 07 Aug 2019

Reviewer: Angelo Gaffo

Reviewer's report:

This is an informative study. I cannot identify a good pre-specified research hypothesis outside of just reporting on the performance of this novel DECT technology. The authors try to correlate their findings about burden of urate deposition to some clinical features collected but this - again - does not appear hypothesis driven and is quite disorganized.

Page 1, line 12: best term is "monosodium urate crystals in tissues"

Page 1, line 19: "incident and prevalent gout" are confusing terms in this context - these are epidemiological term, not clinical. Do the authors mean new and established cases of gout? Probably that would be a better term - more clear for the reader.

Page 2, line 29: is not clear what statistic is quoted here (is that a beta coefficient 0.64?)

Page 2, line 30: "artefacts". Here and throughout the manuscript what is called "artefacts" should be "artifacts"

Page 2, line 32: "readings" should be "readers"

Page 3, line 59: "two technical DECT solution", but earlier in the introduction is described as 5 types of DECT technology. This is confusing.

Page 3, line 74: "incident and prevalent" as before

Page 4, line 91: can the authors explain more about "beam hardening" and "noise". These terms are unfamiliar to the rheumatologist

Page 4, line 117: "all patients fulfilled…..classification for gout". This probably should go in the methods - that all patients enrolled had to fulfill classification criteria

Page 6, lines 131-134: the statistics in the last paragraph in the results are incompletely explained (e.g; what is 0.64?)

Discussion: is there any reason to believe that DECT GSI would perform better than conventional DECT technology currently available?
I cannot find any reference in the body of the text to the figures presented.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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