Reviewer's report

Title: Microcytosis and possible early iron deficiency in paediatric in-patients: a retrospective audit

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Reviewer: Rosline Hassan

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The manuscript by Deepak et al entitled 'Microcytosis and possible early iron deficiency in paediatric in-patients: a retrospective audit' aiming to evaluate and improve the identification, follow-up and treatment of abnormally low MCV results in paediatric in-patients group in English district hospital.

The study provides important information on the insight of treating doctors and the authors have also documented ways to improve and create awareness among the clinician in order to achieve a better health care system. The study also highlighted the importance of using age-specific limits for Hb and MCV for paediatric patients.

However some important issues are addressed below in order to ensure the scientific value is sufficient for the publication.

Major Compulsory Revision

1. Background:
Para 3 Line 7: we decided to use MCV as an indicator....... It is not accurate to use only MCV as an indicator for iron deficiency. Authors have described in the background about the causes of microcytosis and it is also commonly a feature of anaemia of chronic disease especially in hospitalized patients.

Author should also discuss on the reliability of the MCV as a screening of iron deficiency compared to mean corpuscular hemoglobin (MCH), the pre-analytical factors that might interfere with the reading of MCV.

Para 3 line 9: ........ are unhelpful in acute in-patient setting:

This statement should be deleted. Diagnosis of iron deficiency requires at least measurement of serum ferritin which is the earliest marker to be affected and reduced. However in acute phase of illness the level of serum ferritin can be normal and authors can refer the level to the reference range given for cases.
with underlying inflammation

2. Methods

Para 2 Line 4-line 7: We excluded those results where the MCV was greater than 82 fl (…). The age-specific limits……………………for their age.

The whole statement require rephrasing
a. Identify the unit used for MCV.
b. These two statements were the exclusion criteria but both contradict one another. It is not clear on which exclusion criteria preferred in this study

Para 3

Authors have categorized low MCV into three types. Using this classification, authors have included all causes of microcytosis inclusive of anaemia of chronic disease and thalassaemia in the data for analysis. This will not answer the title of the study where the focus is on the ‘possible early iron deficiency….’, unless authors have excluded other possible causes of microcytosis such as thalassamia and anaemia of chronic disease

Para 3, Line 12: ………..groups whether the abnormalities ……….

Need clear documentation on the abnormalities mentioned. What type of abnormalities: lab result or clinical?? If lab result, whether it is Hb or MCV?

Para 5: …. approval from ethics committee was not required

According to Helsinki guideline on research and ethic, ethical approval is required for retrospective studies as an evidence that authors have maintained patients’ confidentiality.

3. Results

Data for analysis need to be clean by exclusion other causes of microcytosis, refer ‘Methods’ Para 3 comments

Two figures were displayed showing the results of two subsequent audits. It would be beneficial and scientifically sound if both results are combined in a table showing a statistical difference between the groups.

No reference in the text is made for Figure 1 and Figure 2.

4. Discussion

Para 4 Line 21-23: Our audit relied upon the subjective classification……………operator bias. However, this was minimized by only having two analysers.

Having two analysers will cause bias on the classification of microcytosis. However this bias is negligible if the analysers were well maintained and the correlation studies between analysers were performed.
Bias in the classification of illness into explicability can occur during data retrieving and it is operator dependent.

5. Conclusion
Para 1 Line 1: ……… improvement in detection rate of microcytosis

To rephrase into: improvement in the documentation rate or awareness of microcytosis by clinicians.

Authors should also include the suggested protocol for the clinician to follow in cases when patient presented with microcytosis.

Minor Essentials Revisions

Please revised the English in the manuscript.

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published.

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.