Peer Review File

Multiple international papers have explored climate factors with regards to epistaxis in single centres. Very little Australian data however exists exploring incidence of epistaxis and the role of climate in Australia. The authors compare and contrast cases in a tropical climate city with those in a temperate oceanic climate providing a point of difference from previously published papers.

Introduction:

Comment 1:

Did the authors find any Australian data on the incidence and epidemiology of epistaxis in Australia? If not, this might be worth mentioning in the introduction as a knowledge gap.

Reply 1:

There is a lack of good epidemiological data regarding epistaxis in Australia and we agree that this should be mentioned.

Changes in the text:

We have amended the introduction on line 66-67 to reflect the paucity of Australian data regarding Epistaxis epidemiology.

Comment 2:

Line 62: Reference 1 is from 1975 on the incidence of epistaxis in males only. This statistic has been widely used in epistaxis publications and has thus provided very biased epidemiological data for decades. Given very little else seems to exist the authors may want to comment on the bias of available data.

Reply 2: We have amended the introduction to point out the lack of robust epidemiological data.

Changes in the text:

Line 61-63 has been re-written to state robust epidemiological data is lacking for epistaxis and that this is likely due to significant non-presenter bias.

Comment 3:

Line 64-65 - American data? If no Australian data once again is a knowledge gap.

Reply 3:

This is American data and we have amended the text to reflect this from line 65 to 67.

Changes in the text:

We have added "In the United States of America.." on line 65 to specify where this admission data is referenced.

Comment 4:

Line 72 - reference 4 - if mentioning studies plural, one reference isn't enough. The authors include a number of papers in their discussion but may consider including some of the others There are many papers that discuss climate and epistaxis that the actors may want to acknowledge or reference.

Reply 4:

We agree with this comment and have made reference to these additional studies. Some of these were referenced in the discussion but it is worth noting this evidence base in the introduction.

Changes in the text: Added 5 additional references on line 74.

Comment 5:

Figure 4 - the y axis scales are different on the 2 charts. Not all the number/colours are quite right eg cairns monthly dewpoint/cairns total ed presentations reads 0.1 but is coloured as a -ve 0.1 - which one is it?.

Figure 5 also has different y axis across the 2 graphs.

Reply 5:

We have generated the heat map charts (figures 4 and 5) in an alternative colour scheme without a variable gradient. Previously the gradient was causing colour discrepancies due to rounding and we feel this new colour scheme solves that issue. Furthermore we have adjusted the y axis on the two figures graphs to be the same.

Comment 6:

Line 187: isn't the difference with humidity results due to Melbourne having cold but wet winters, where as cairns has highest humidity during summer when it is warm? Suggesting it is the combination of humidity and warm air that is protective. The authors further discuss this when discussing dew point but may want to explicitly spell this out for a non-Australian readership.

Reply 6:

This is correct in terms of interpretation of the results between the two cities and we have now mentioned this protective effect so that it is clearer in the text.

Changes in the text:

On line 191-193 we have added text that describes the likely protective effect of combined warm temperature and increased humidity in Cairns on epistaxis presentations.

Comment 7:

Line 192 - few or non? If there is one it should be referenced if non that can be stated.

Reply 7:

Yes there is a study and we have now added the reference on line 198.

Comment 8:

Table 2 - can't see a reason why we need the Melbourne population data presented as 2 regions, this will mean nothing for most readers. Should the populations just be combined?

Reply 8:

We agree with this comment and have combined the populations for the Melbourne local health districts into Melbourne (North East).

Reviewer B

This is a well written and interesting retrospective analysis assessing the associations between spontaneous epistaxis presentations and climactic variables.

I have a few comments:

Comment 9:

The older age of the cohort in Austin means the likelihood of anticoagulation higher which may be a confounder. Could the authors comment on this.

Reply 9:

We discuss this in the conclusion and have made reference to it being a potential confounder now on line 223.

Comment 10:

Was there any association with pollution noted when assessing climactic variables?

Reply 10:

Unfortunately, we did not look at air pollution or air quality indices for this project.

Comment 11:

The presentations are in absolute numbers but could they be presented as % of the population in each city or LHD?

Reply: 11:

There is a significant population delta between Cairns and Melbourne and we do not believe that having presentations as a % of population would improve the analysis. Using presentations as a percentage of total city population in the regression would result in very small percentages given the small number of presentations per month compared to city populations.

Comment 12:

I am not sure the authors can recommend increased humidification based on these results due to the older population in the Austin cohort.

Reply 12:

We agree this recommendation needs to be broader in scope.

Changes in the text:

We have re-written the sentence (line 208-210) to suggest humidification as a preventative strategy would be supported for those patients prone to epistaxis, rather than age alone.

Editorial Comments

Many thanks for the careful revisions. I found the revised manuscript much improved. However, there are still some issues that need to be addressed. Please see the comments below.

Title

1. The word "predictors" in the title may not be appropriate. And "Climatic predictors of epistaxis" could be deleted from the title.

Reply: We agree with this suggestion.

Changes in the text: "Climatic predictors of epistaxis" has been removed from the title.

Abstract

2. You need to provide the study time span (year-month-day) and study design (cohort study) in the Abstract-Methods.

Reply: We have added the study design and the study time span into the methods section of the abstract.

Changes in the text: Amended lines 41-43 to include cohort study and study time period.

3. It is essential to specify the confounding factors and how the authors managed them in the Methods. Taking into account and addressing confounding variables is critical for ensuring accurate research outcomes.

Reply: This is an important observation and our study was limited in that we only controlled for known confounders such as trauma and recent nasal surgery in the exclusions. We have edited the methods section and additionally added that we did not control for clinical characteristics in the discussion section. We would also note that the majority of papers on this topic also suffer from similar flaws in study design.

Changes in the text: Amended line 105-107 to describe control of known causative factors of epistaxis (trauma and recent surgery). Added further limitations of the study at line 259 "This study was limited by the retrospective design and that we did not control for clinical co-morbidities except for known causes of epistaxis such as trauma and recent nasal surgery."

4. Line 139-141"Correlation coefficients (R) between −0.4 and +0.4 were considered as weak correlations, between +0.4 and +0.7 or −0.4 and −0.7 as moderate correlations, and ≥0.7 or ≤−0.7 as strong correlations." The correlation strength definition requires citing relevant literature.

Reply: We have now cited the relevant literature for this statement.

Changes in the text: Line 141 reference (12) added to the text.

5. How was missing data handled? How to perform the sample size estimation? This should be added in the Methods.

Reply: Meteorological variables were complete from the national archives and thus there was no missing data to account for. Where patient clinical characteristics/co-morbidities were not reported in the records then this was assumed as not present and we have added this to the methods section.

Changes in the text: Added line 117 "where clinical characteristics were not available…"

6. Please report whether the P value was a one-sided or two-sided test.

Reply: The P value was a two-sided test.

Changes in the text: In the statistical analysis section of the methods we have updated the text to reflect a two-sided P value (line 144).

7. The authors repeatedly mentioned "Melbourne, Cairns, and Austin" in the text, which may have caused confusion among readers who are not familiar with the locations of the hospitals mentioned. It may be helpful to replace the word "Melbourne" with "Austin" to clarify the locations being discussed.

Reply: We agree this could be confusing to the non-Australian reader and have updated the manuscript to replace "Melbourne" with "Austin" in the text. Additionally we have updated figures 2-5 to replace "Melbourne" with "Austin".

Changes in the text.: Replaced "Melbourne" with "Austin" where appropriate.

Results

8. Please use a flow chart to present a specific process for including participants, from the initial selection of potentially eligible patients to the final inclusion of patients, with reasons for any exclusion. For your information, here is an example of our sister journal (See Figure 1): https://qims.amegroups.com/article/view/92472/html.

Reply: We have now included a flow chart for patient selection.

Changes in the text: Added patient selection flowchart (figure 1) and referenced flow chart in results at line 150.

9. The statement "Patient demographics and clinical characteristics (Table 1) demonstrated a higher average age of presentation at Austin compared to Cairns with a similar gender bias towards male presenters", may be misleading without statistical evidence. It would be helpful if the authors reported the statistical significance (p-value and 95% CI) in Table 1 to support this finding.

Reply: We agree this could be misleading and have added context to the text that this gender bias was not statistically significant.

Changes in the text: added "however this bias was not statistically significant at either institution" on line 152-153.

10. Line 167-172 "Pearson correlation analysis demonstrated … at Austin while this was negative at Cairns for both months and seasons." Please provide specific information (correspondence coefficient, 95 CI, and P value) rather than just a description of how strong the correlation is.

Reply: We have now provided the Pearson correspondence coefficients, 95% confidence intervals and P values for monthly and seasonal variables at both hospitals in the text.

Changes in the text: Rewritten lines 188-181 to include the requisite statistical variables.

Figures and Tables

11. It is recommended to remove Table 2, and the data and results of Table 2 can be described in the text.

Reply: We have removed Table 2 and described the data in the text.

Changes in the text: Removed Table 2 and added median age of local government areas for Austin and Cairns to the text in line 246-248.

12. Combining the data in Figures 1, 2, and 3 into one table is suggested. Just for your reference:

	Cairns					Melbourne				
	Mean monthly temperature(°C)	Mean monthly humidity(%)	Mean monthly dew point(°C)	Epistaxis ratio by month	Epistaxis ratios by season	Mean monthly temperature(°C)	Mean monthly humidity(%)	Mean monthly dew point(°C)	Epistaxis ratio by month	Epistaxis ratios by season	Mean monthly temperature(°C)
January											
February											
March											
…											

Reply: We have combined figures 1-3 into a summary table as suggested.

Changes in the text: Removed previous figures 1-3 and have referenced new Table 2 in lines 157, 162 and 165.

13. Lines 142-145 state that "Univariate linear regression analysis between the number of epistaxis cases per month and mean monthly temperature (°C), mean monthly humidity (%) and mean monthly dew point were performed", but the analysis regarding mean monthly humidity was not presented in the Results section (see Figure 6).

Reply: We agree this is an oversight and have added the regression analysis charts for humidity into figures 6 and 7.

14. Lines 244-246 state that "Patient sub-group correlation analysis of clinical characteristics was not sufficiently powered to draw statistically significant conclusions", but there is no sub-group analysis presented in the Results section.

Reply: This is correct and the current text is misleading. We have re-written this sentence to note sample sizes for clinical characteristics were not sufficient to conduct subgroup analysis.

Changes in the text: Line 252-253 re-written to state "Sample sizes for patient clinical characteristics were not sufficiently large enough to conduct subgroup analysis…"

15. Please note, you need to report 95%CI and P values in both the Abstract, Results, and Tables.
Reply: Added 95% CI and P values to abstract and results sections.
Changes in the text: Line 51-55 amended with 95% CI and P values. Lines 169-181 amended to add correlation coefficients, 95% CI and P values.

Other concerns
16. Make sure that the decimal point stays in the same place, such as Correlation coefficients (R).

17. Please kindly revise the form of the P-value in the report according to our criteria below:
If $P < 0.001$, please report "$P < 0.001$";
If $0.001 \leq P < 0.01$, please report the specific P-value to 3 decimal places, e.g., "$P = 0.001$", "$P = 0.009$";
If $P \geq 0.01$, please report the specific P-value to 2 decimal places, e.g., "$P = 0.01$", "$P = 0.06$", "$P = 0.10$", "$P = 0.90$";
If $P > 0.99$, report "$P > 0.99$".
Do not round P-values, do not report 'not significant' simply because the data is greater than an arbitrary value, and do not report only vague bounds such as $P < 0.05$.

Reply: Amended the formatting of P values within the text to abide by AJO criteria.