

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Lack of weight recording in patients being administered narrow therapeutic index antibiotics – a prospective cross-sectional study
AUTHORS	Charani, Esmita; Gharbi, Myriam; Hickson, Mary; Othman, Shokri; Alfituri, Aisha; Frost, Gary; Holmes, Alison

VERSION 1 - REVIEW

REVIEWER	Sarah Hilmer Royal North Shore Hospital and University of Sydney Australia
REVIEW RETURNED	30-Jul-2014

GENERAL COMMENTS	<p>This secondary analysis of data from a larger study addresses an important previously reported issue: failure to record weight in hospitalised patients.</p> <p>Several limitations need to be addressed. Firstly, it is not clear whether the sample of about 1/3 of the hospitalised patients is representative of all hospitalised patients at this institution. It is also not clear whether practice at this institution is generalisable to other hospitals. Antimicrobials are only one drug class that require weight based dosing for safety and efficacy. Some mention should be made of other classes eg low molecular weight heparins.</p> <p>The paper would be stronger if it included clinical outcomes of weighing patients, in terms of doses prescribed, therapeutic failure or drug toxicity, or global outcomes such as length of stay or mortality.</p> <p>The observational data on weighing during the admissions process (n=18) is the most novel element of this study and should be included in the abstract.</p> <p>The discussion needs to be fully referenced and to adhere to the usual structure (results, comparison with literature, strengths and limitations).</p> <p>Table 2 column 3 may not be required in table form.</p>
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REVIEWER	George Mnatzaganian Australian Catholic University, Australia
REVIEW RETURNED	01-Aug-2014

GENERAL COMMENTS	<p>Main concerns:</p> <ol style="list-style-type: none">1. The methods used to conduct this cross sectional study are not clear. It is not clear if the survey was conducted on a single day across all three hospitals. Also it is not clear how this day or these days was/were selected. The original study was conducted during a
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longer time period (March 2011- Sep 2011 & July 2012 –Aug 2012); however, this time period is not relevant for this current study and the inclusion of this period in the Abstract is very confusing. This should be stated in methods only. It is not clear what the authors mean by the “two episodes of the cross sectional study”.

2. The findings of the in-depth observation may not be valid. The authors assessed weight registration on admission. But, often weight of the patients is registered during the hospitalization. For example, this is done when an antibiotic is started or just before surgery. So the results of this in-depth observation may lack validity being mainly an underestimate of the real weight recording.

3. It is not clear why patients not present on the ward on the day of the survey were excluded? These patients needed to be included if they were still hospitalized on that day. Their exclusion is not correct especially because the information on the weight recording was extracted from the patient records.

4. This study in its present form is too simplistic and it does not add any new information to already known knowledge. Much has been written about weight recording. In a recent publication, my colleagues and I – see below – found that weight is more likely to be recorded for those who were sicker and who were morbidly obese. We further recommended the routine recording of weight.

Mnatzaganian G, et al. Use of routine hospital morbidity data together with weight and height of patients to predict in-hospital complications following total joint replacement. BMC Health Services Research 2012, 12:380 doi:10.1186/1472-6963-12-380

To make this current paper more interesting and in order to contribute to this literature it will be useful if the authors can consider the following:

a. Describe those with and without a recording of weight. Are those with a recording sicker, heavier, and older, etc.? If yes, then this current study may validate the findings of the above paper.

b. It is interesting to know what predicts weight being recorded. I advise the authors to consider running a logistic model which may prove very informative. The current analysis is very crude being so descriptive without adding any additional information to already known knowledge.

c. The methods must be better explained especially how was the survey day selected and why.

5. The discussion of antimicrobial resistance seems less relevant – especially in the Abstract. The authors claim or rather hypothesise that administering antibiotics without first weighing the patient is associated with antimicrobial resistance but they do not prove it. If this is a study hypothesis, then the authors need to show such an association in their study. If no such thing exists, please omit all discussion about resistance.

Minor comments:

1. The word “data” is in plural form. The singular form is “datum”. So “data were”... The authors often relate to this word in singular

	and often in plural form. Please revise. 2. There are a few grammatical mistakes throughout the manuscript. Please revise.
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REVIEWER	Winfried Kern University Hospital Freiburg Germany
REVIEW RETURNED	11-Aug-2014

GENERAL COMMENTS	<p>This is an interesting paper which is also timely in view of the proposed documentation of weight quality indicator for assessing hospitals. My (only) concern is how representative the sample can be regarded.</p> <ul style="list-style-type: none"> - There should be additional information about <ul style="list-style-type: none"> i) the services/type of wards visited (emergency medicine, ICU, general internal, obstetrics, etc.) and the representativeness for this hospital (only 1/3 surveyed !) ii) the influence of gender and of time since admission on the proportion weighed (just recently admitted patients might have a greater risk to be unweighed ?) - Observational substudy: "three issues where consistently identified as a barrier" - what does "consistently" mean ? Was this substudy repeated ? - Do you have any control item to be checked such as notes on the patient history re profession/type of work and/or recent medication and/or allergy history or similar ?
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1

This secondary analysis of data from a larger study addresses an important previously reported issue: failure to record weight in hospitalised patients.

Response: We appreciate that the value and importance of this research is recognised.

Several limitations need to be addressed. Firstly, it is not clear whether the sample of about 1/3 of the hospitalised patients is representative of all hospitalised patients at this institution.

Response: The sample represents 1/3 of the bed capacity, if the hospital was at full bed occupancy and all specialties were included. Paediatric, obstetrics and gynaecology, and haematology and oncology wards were excluded from the data collection. Text to clarify this has been added to the methods section (page 4, line 24). The data is representative of the specialties visited across the two data collection points.

It is also not clear whether practice at this institution is generalisable to other hospitals.

Response: This study represents data from three teaching hospitals in West London, which together form one National Health Trust Institution and therefore are representative of practice across three hospitals. We have amended the text in the abstract (page 1, line 5), introduction (page 4, line 16)

and methods (page 4, line 21) to clarify this.

Antimicrobials are only one drug class that require weight based dosing for safety and efficacy. Some mention should be made of other classes eg low molecular weight heparins.

Response: We acknowledge this fact and have amended the introduction (page 4, line 10) to refer to other drugs requiring weight based dose adjustment. Since the focus of this study was investigating narrow therapeutic index antimicrobials we have made them the main point of discussion.

The paper would be stronger if it included clinical outcomes of weighing patients, in terms of doses prescribed, therapeutic failure or drug toxicity, or global outcomes such as length of stay or mortality.

Response: Whilst we appreciate this comment, we have conducted a prospective cross-sectional design study and therefore no longitudinal data were collected. To investigate the impact of weight recording on clinical outcomes we would have needed to adopt a longitudinal design.

The observational data on weighing during the admissions process (n=18) is the most novel element of this study and should be included in the abstract.

Response: We are very glad the findings are considered in such a positive light. We have amended the abstract to include details of the observational study.

The discussion needs to be fully referenced and to adhere to the usual structure (results, comparison with literature, strengths and limitations).

Response: The discussion has been amended and references added.

Table 2 column 3 may not be required in table form.

Response: Thank you, column 3 has been removed.

Reviewer: 2

The methods used to conduct this cross sectional study are not clear. It is not clear if the survey was conducted on a single day across all three hospitals.

Response: We have expanded the methods section. The data from each individual ward were collected in a single day. A reference (ref 13) has been added to illustrate and provide further reading on the methodology used.

Also it is not clear how this day or these days was/were selected.

Response: Please see response to point above.

The original study was conducted during a longer time period (March 2011- Sep 2011 & July 2012 – Aug 2012); however, this time period is not relevant for this current study and the inclusion of this period in the Abstract is very confusing. This should be stated in methods only. It is not clear what the authors mean by the “two episodes of the cross sectional study”.

Response: Please see response to point above.

The findings of the in-depth observation may not be valid. The authors assessed weight registration on admission. But, often weight of the patients is registered during the hospitalization. For example,

this is done when an antibiotic is started or just before surgery. So the results of this in-depth observation may lack validity being mainly an underestimate of the real weight recording.

Response: We agree with reviewer 1, that the observational study adds context and value to this investigation. The cross-sectional study has captured the proportion of patients who have their weight recorded on the charts or the medical records, whether it is for antibiotic administration or any other purpose. The point of the observational study was to investigate the barriers and facilitators to weight recording in the clinical setting at admission as there are clear sections in the admission notes for patient weight and height recording. For this reason we feel it can add context and value to the manuscript.

It is not clear why patients not present on the ward on the day of the survey were excluded? These patients needed to be included if they were still hospitalized on that day. Their exclusion is not correct especially because the information on the weight recording was extracted from the patient records.

Response: The patients who were absent from the ward due to an investigation e.g. x-ray or CT scan will have had their notes including medication chart taken with them, therefore we could not include them in the study. Text to clarify this has been added to page 5, line 12 in methods. By patient record we mean paper medical and records and medication charts. We do not mean hospital morbidity data. This is explained in the methods section.

This study in its present form is too simplistic and it does not add any new information to already known knowledge. Much has been written about weight recording. In a recent publication, my colleagues and I – see below – found that weight is more likely to be recorded for those who were sicker and who were morbidly obese. We further recommended the routine recording of weight. Mnatzaganian G, et al. Use of routine hospital morbidity data together with weight and height of patients to predict in-hospital complications following total joint replacement. BMC Health Services Research 2012, 12:380 doi:10.1186/1472-6963-12-380

Response: We are very grateful for this comment. We note that the paper the reviewer refers to investigated patient morbidity data and their recommendation was to add routine recording of weight to morbidity data. In our study we considered weight recording in the clinical setting in the absence of electronic medical records (page 5, line 7, methods). Therefore we intended to capture practice in weight recording at the point of care. It is for this reason that the observational element adds context to our study.

To make this current paper more interesting and in order to contribute to this literature it will be useful if the authors can consider the following:

a. Describe those with and without a recording of weight. Are those with a recording sicker, heavier, and older, etc.? If yes, then this current study may validate the findings of the above paper.

Response: We have considered the reviewers recommendation and have now conducted statistical analysis to identify if any of the patient specific variables influence weight being recorded. Text has been added to methods and results (pages 5-6, 8) to detail this in addition to a new table (table 3, page 15).

Upon statistical analysis we did find that patients who were older, more sick and heavier were more likely to have a recorded weight. These findings do mirror the findings of the Mnatzaganian et al paper, though they compared clinic measured weights with those recorded in hospital morbidity databases and not individual clinical records i.e. medication charts and notes.

b. It is interesting to know what predicts weight being recorded. I advise the authors to consider running a logistic model which may prove very informative. The current analysis is very crude being so descriptive without adding any additional information to already known knowledge.

Response: As above we have included this in the manuscript.

c. The methods must be better explained especially how was the survey day selected and why.

Response: Methods have been expanded to include the recommendations of the reviewer.

The discussion of antimicrobial resistance seems less relevant – especially in the Abstract. The authors claim or rather hypothesise that administering antibiotics without first weighing the patient is associated with antimicrobial resistance but they do not prove it. If this is a study hypothesis, then the authors need to show such an association in their study. If no such thing exists, please omit all discussion about resistance.

Response: In the context of patient safety and unintended consequences of not recording patient weight we feel that the discussion with respect to antimicrobial resistance is an important one. In particular when placed in the context of rising antimicrobial resistance and the need to find solutions to enable prudent use of antibiotics. We have amended the abstract conclusion to reflect our point more clearly.

The word “data” is in pleural form. The singular form is “datum”. So “data were”... The authors often relate to this word in singular and often in pleural form. Please revise.

Response: This has now been amended to refer to the data in plural sense. All changes are highlighted in track changes.

There are a few grammatical mistakes throughout the manuscript. Please revise.

Response: Many thanks, we have amended any typos in the document and these are all highlighted in track changes.

Reviewer: 3

This is an interesting paper which is also timely in view of the proposed documentation of weight quality indicator for assessing hospitals. My (only) concern is how representative the sample can be regarded.

Response: Thank you for the positive comment in relation to the value of our study to the existing literature. This study represents data from three teaching hospitals in West London, which together form one National health Trust Institution and therefore are representative of practice across three hospitals. We have amended the text in the abstract (page 1, line 5), introduction (page 4, line 16) and methods (page 4, line 21) to clarify this.

There should be additional information about

i) the services/type of wards visited (emergency medicine, general internal, obstetrics, etc.) and the representativeness for this hospital (only 1/3 surveyed)

Response: The sample represents 1/3 of the total bed capacity, if the hospital was at full bed occupancy and all specialties were included. Paediatric, obstetrics and gynaecology, and

haematology and oncology wards were excluded from the data collection. Text to clarify this has been added to the methods section (page 4, line 24). The data is representative of the specialties visited across the two data collection points.

ii) the influence of gender and of time since admission on the proportion weighed (just recently admitted patients might have a greater risk to be unweighed ?)

Response: Our study was not powered to measure time lapse since admission. Gender has now been included in the logistic regression model provided in table 3.

Observational substudy: some explanation about what "consistently" does mean ?

Response: This word has been replaced with the term 'most frequently' to clarify the point that was being made.

It would be interesting to having assessed a control item (e.g. medical history item such as profession/type of work and/or recent medication and/or allergy or similar)

Response: We agree this is an interesting suggestion. A good control item would have been allergy or blood pressure on admission. However measuring a second item was beyond the scope of our study.

VERSION 2 – REVIEW

REVIEWER	Dr George Mnatzaganian Australian Catholic University, Australia
REVIEW RETURNED	04-Sep-2014

GENERAL COMMENTS	<p>1. Please add the adjusted OR and 95%CI for gender and age in the multiple logistic regression model. In the text, the authors discuss that age is not significantly associated with the outcome but say nothing about gender. I prefer to see all values in the model.</p> <p>It is also not clear why 'age' is listed as categorical variable. It is best to add it as a continuous variable. A continuous variable increases the model discrimination better than a categorical variable.</p> <p>2. Having the variable "death during stay" as a predictor for weight recording makes little sense. First we often do not know who will die and who will not. Second, dead bodies are often not weighed after the death unless these are considered for organ donations. One logical explanation for this significant finding could be that those who died were so sick and so bed ridden that weighing them was less possible (hence the OR is less than 1). I personally would advise the authors to consider removing this variable from the model.</p>
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REVIEWER	Winfried V. Kern ID Division, University Hospital Freiburg. Germany
REVIEW RETURNED	25-Sep-2014

- The reviewer completed the checklist but made no further comments.

VERSION 2 – AUTHOR RESPONSE

Reviewer 1

Please add the adjusted OR and 95%CI for gender and age in the multiple logistic regression model. In the text, the authors discuss that age is not significantly associated with the outcome but say nothing about gender. I prefer to see all values in the model.

Response: The OR and 95% CI for gender and age have been added.

It is also not clear why 'age' is listed as categorical variable. It is best to add it as a continuous variable. A continuous variable increases the model discrimination better than a categorical variable.

Response: Age has been changed to a continuous variable.

2. Having the variable "death during stay" as a predictor for weight recording makes little sense. First we often do not know who will die and who will not. Second, dead bodies are often not weighed after the death unless these are considered for organ donations. One logical explanation for this significant finding could be that those who died were so sick and so bed ridden that weighing them was less possible (hence the OR is less than 1). I personally would advise the authors to consider removing this variable from the model.

We have removed death as a variable from the model.

We can confirm that all the authors have seen and approved the manuscript, contributed significantly to the work and that this manuscript is not being considered for publication elsewhere. In light of the changes made to the manuscript we would like to add a further author to the manuscript, Aisha Alfituri, as she was responsible for much of the observational study and the analysis of the observational data. We wait to hear from the editors with regards to this matter.