

A Comparative Study to Evaluate the Degree of Correlation between Emergency Department Admission Diagnosis and Hospital Discharge Diagnosis

Indraneel Dasgupta¹, Amit Kumar Yadav², Indranil Mitra³

Author's Affiliation:

¹Clinical Director ²Masters in Emergency Medicine, 3rd Year PGT ³Consultant, The Institute of Emergency and Trauma Care, Peerless Hospitex Hospital and Research Centre Limited, Kolkata, 360, Panchasayar, Kolkata, West Bengal, Pin: 700094.

Corresponding Author:

Indraneel Dasgupta, Clinical Director and Head, Department of Emergency Medicine, The Institute of Emergency and Trauma Care, Peerless Hospital & B.K.Roy Research Center 360 Panchasayar, Kolkata - 700094 West Bengal.
E-mail: dgindraneel@rediffmail.com

Received on 17.05.2017,
Accepted on 30.05.2017

Abstract

Objective: Degree of correlation between Emergency Department admission and hospital discharge diagnosis. **Design:** A prospective study in a six month period at Accident and Emergency Department of Peerless Hospital and B.K. Roy Research Centre, Kolkata, which had four in-patient specialties- Medicine, Surgery, Paediatrics and Orthopaedics. **Subjects:** All cases admitted through the emergency department in the study period. **Main outcome measures:** degree of correlation between emergency department admission diagnosis and hospital discharge diagnosis. **Results:** of all admission diagnosis, 75.77% was accurate or partially accurate to the final discharge diagnosis. The accuracy of diagnosis was statistically better in traumatic cases, male sex, and younger adults. **Conclusion:** history taking and physical examination remained the most important diagnostic tools in the emergency department. Simple investigations available at the emergency department were not helpful in improving diagnostic accuracy.

Keywords: Diagnosis; Diagnostic tools.

Introduction

Emergency Department is one of the most important wards in a hospital and its function has important effects on the other parts of the rest of the hospital as well as in the level of general public's satisfaction. It plays an important role in reducing mortality and morbidity by making correct and quick diagnosis and providing proper treatment. Emergency medicine specialists must possess necessary skills and the knowledge in approach to life threatening problems in order to provide correct diagnoses and therapies. The diagnosis made by Emergency medicine physician has often been doubted by the other specialist doctors and admission of patients in their wards. In order to have a judgment on diagnostic and clinical ability of the Emergency physician many studies have been tried to compare the first diagnosis made in Emergency Department with the diagnoses made in the wards.

As in India Emergency Medicine is a new upcoming

specialty, Recently, the practice of trained Emergency physician manning the Emergency Department has been established in several hospitals in our country, though; on the other hand, lot of hospitals Emergency Departments are still manned by junior doctors only. However, no previous study has been done in India involving the Emergency Department to assess the performance or needs of these trained Emergency Physicians. In our hospital, the ED is manned 24hrs by trained Emergency Physician and has direct admitting rights to the inpatient service and would therefore be an ideal place for such a study. It was hoped that comparison of Emergency admission diagnosis and discharge diagnoses would give a picture on the existing performance of the Emergency Department and also serve as a baseline for future reference in continuous quality improvement. By showing such ability of Emergency Department physicians, we can propose that the Emergency Medicine specialist can safely provide initial management to patients with variety of complaints.

Study Objective

To correlate the diagnosis made in the Emergency department at the time of admission and diagnosis at the time of discharge.

Study Methodology

This was a prospective observational study done over the course of 6 months in the Emergency Department of a tertiary care centre. The primary outcome measures of this study were the degree of correlation between Emergency Department admission diagnosis and hospital discharge diagnosis. Emergency Department admission diagnosis made by Emergency Medicine residents and Emergency specialist and categorized as "accurate", "partially accurate", and "inaccurate". An analysis of the admission diagnosis was performed for all patients admitted from the Emergency Department and compared with the final diagnosis, as given on the discharge or the death certificates. Specificity of the provisional diagnosis made by ED doctors was thereby examined. This study conducted in the Department of Emergency Medicine of Peerless Hospital and B. K. Roy Research Centre, Kolkata from July 2014 to December 2014, duration of approximately 6 months. Peerless hospital is a 300 bedded multispecialty hospital and a tertiary referral centre in Kolkata. The Emergency department admits 35 patients everyday in the different departments like general medicine, gastroenterology, nephrology, pulmonology, neurology, surgery, cardiology, orthopaedics, gynaecology, etc. The study population included all the patients attending the Emergency Department during the above mentioned period and had undergone clinical and diagnostic evaluations in the ED by EM residents and specialist and later admitted and hospitalized under one of the specialties of the hospital.

This study excluded the following patients:

1. Those that were referred to the ED with definitive diagnosis from another hospital or doctors who had previously seen the patient.
2. Patients with no clear final diagnosis in ED, for example a patient who was hospitalized for more workups.
3. Patients, had visited ED before and had a diagnosed condition
4. Patients brought to ED with complication of underlying diseases.

5. Patients who were discharged from hospital or died without a final diagnosis
6. Patients who were directly admitted to the wards from the OPD.

The total sample size that is analyzed to the study is 582.

Data Presentation and Results

Crude data has been recorded in Microsoft Excel and statistical analysis has been done by our medical statistician. Validity of clinical examination and diagnostic investigations as tool for matching of final diagnosis and provisional diagnosis has determined by appropriate statistical software.

A total of 582 admissions were included in the study. The age ranged from less than one year to 100 years old (mean 46, median 52). Although we did not have a geriatric unit in our hospital, when the adult patients were split by age into 15-60 years and 60 years above, it was found that the diagnostic accuracy was significantly better in the younger age group(86.86% versus 65.95%, $p < 0.001$). The male and female ratio was 1.87:1. The male population was older than the female (male mean age 48, female age 43). The male sex was associated with better accuracy (84.05% versus 67.70%, $p < 0.001$).

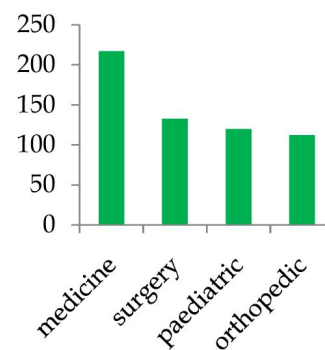


Fig. 1: Total No of Patient and distribution in different department

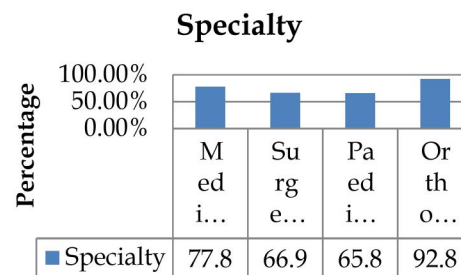


Fig. 2: Full and Partial accurate in different speciality

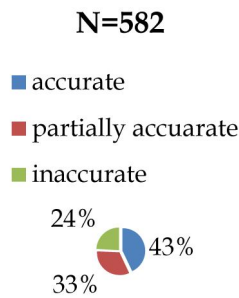


Fig. 3: Matching analysis in total

The majority of patients (217 cases or 37.28%) was admitted to the medicine department. Remaining, 133 cases (22.85%) were admitted to surgery department, 120 cases (20.61%) in paediatric department 112 cases (19.24%) to the orthopaedic department. Of the ED admission diagnosis 75.77% was accurate or partially accurate with the final discharge diagnosis. ED diagnoses that were categorized as partially accurate were listed in method of data collection. They were regarded as partially accurate with the final diagnosis because it was not possible for the ED doctors to make the accurate diagnosis due to departmental limitations. For example, though a diagnosis of haemoptysis could be made confidently in ED, it would not be possible to diagnose the underlining cause clinically in most of the cases. Another reason for assigning a partially accurate to an ED diagnosis was that ED doctors sometimes preferred to put down an open and less specific, and yet informative enough diagnosis to proceed for further management. Thus diagnosis like injuries to foot, hip fracture, and chest infection etc were regarded as partial accurate diagnosis. The accuracy of diagnosis was statistically better in orthopaedic and traumatic cases (92.86%). The inaccuracy was significantly higher in surgery (33%) and paediatric (34%) speciality.

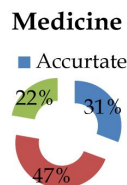


Fig. 4: Analysis of medicine patients

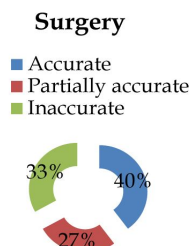


Fig. 5: Analysis of Surgery patients

Paediatric

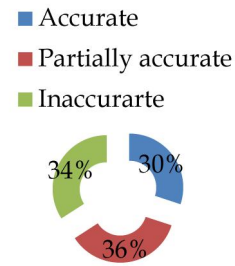


Fig. 6: Analysis of Paediatric patients

The possible reason of high inaccuracy in surgery and paediatric cases was the investigations (like: ECG, X-ray etc. USG was not readily available in ED) available in ED was not very contributory in making ED diagnosis. The diagnostic accuracy in different specialities is listed in figure 2 to 9.

Paediatric

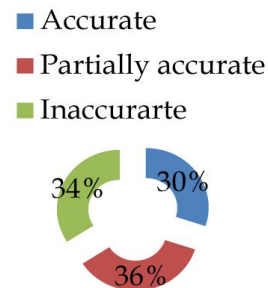


Fig. 7: Analysis of orthopaedic patients

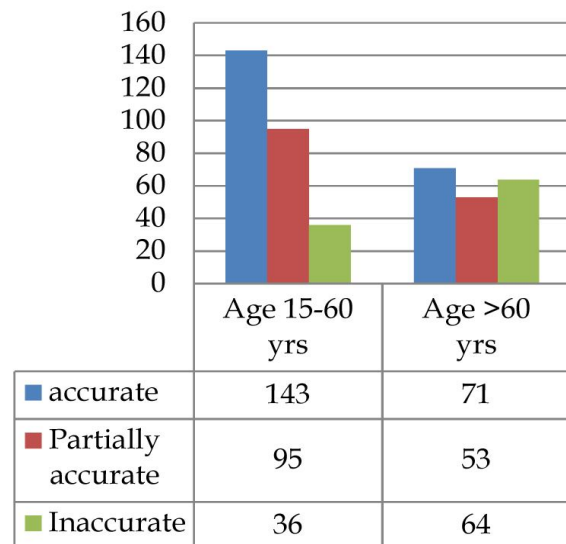


Fig. 8: Analysis of accuracy in adult population split by age

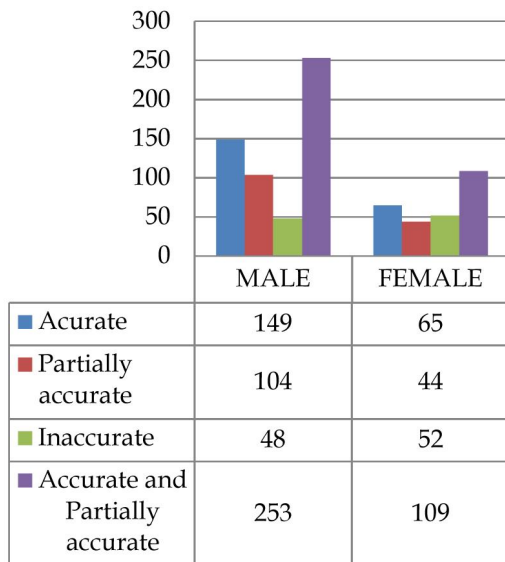


Fig. 9: Analysis of accuracy in adult split by gender

Results

A total of 582 admissions were included in the study. The age ranged from less than one year to 100 years old (mean 46, median 52). Although we did not have a geriatric unit in our hospital, when the adult patients were split by age into 15-60 years and 60 years above, it was found that the diagnostic accuracy was significantly better in the younger age group (86.86% versus 65.95%, $p < 0.001$). The male and female ratio was 1.87:1. The male population was older than the female (male mean age 48, female age 43). The male sex was associated with better accuracy (84.05% versus 67.70%, $p < 0.001$).

The majority of patients (217 cases or 37.28%) was admitted to the medicine department. Remaining, 133 cases (22.85%) were admitted to surgery department, 120 cases (20.61%) in paediatric department 112 cases (19.24%) to the orthopaedic department. Of the ED admission diagnosis 75.77% was accurate or partially accurate with the final discharge diagnosis. ED diagnoses that were categorized as partially accurate were listed in method of data collection. They were regarded as partially accurate with the final diagnosis because it was not possible for the ED doctors to make the accurate diagnosis due to departmental limitations. For example, though a diagnosis of haemoptysis could be made confidently in ED, it would not be possible to diagnose the underlining cause clinically in most of the cases. Another reason for assigning a partially accurate to an ED diagnosis was that ED doctors sometimes preferred to put down an open and less specific, and yet informative enough

diagnosis to proceed for further management. Thus diagnosis like injuries to foot, hip fracture, and chest infection etc were regarded as partial accurate diagnosis. The accuracy of diagnosis was statistically better in orthopaedic and traumatic cases (92.86%). The inaccuracy was significantly higher in surgery (33%) and paediatric (34%) specialty. The possible reason of high inaccuracy in surgery and paediatric cases was the investigations (like: ECG, X-ray etc. USG was not readily available in ED) available in ED was not very contributory in making ED diagnosis. The diagnostic accuracy in different specialities is listed in Figure 2 to 9.

Discussion

This was the first study on the correlation between emergency department admission diagnosis and hospital discharge diagnosis at our hospital. There have been only a few similar studies in the world literature. Although Li et al reported a diagnostic error of only 4%, his study depended on the initiative of the inpatients specialists for feedback. The response rate in his study was only 49.4% and there might be some selection bias. Thus the present study may be used as a baseline for future study, clinical audit or other quality assurance purpose in the field of diagnostic accuracy of emergency departments.

The degree of specificity and accuracy was satisfactory as a whole, especially in the orthopaedic speciality. However, further improvement is required, especially for elderly and paediatric patients. Concerning paediatric patients, the use of more blood test would be more supportive for predicting serious infections or culture positivity in febrile children. The degree of accuracy was lowest in children the adequacy of ED training in Paediatrics should be reviewed.

One way to improve the ability to arrive at a specific diagnosis and higher degree of diagnostic accuracy is to encourage the listing of a few specific differential diagnoses after each consultation. This ability of differential diagnosis generation should be emphasized during postgraduate training of doctors.

More training in interpretation of X-ray may also help to improve the accuracy. The possible reason of negative effect of X-ray on diagnostic accuracy may be due to over interpretation. This could be due to inadequate experience in X-ray interpretation or due to sub-optimal information from history taking. Seeking the opinion of senior doctors on the site or even radiologist before patient's final disposal may

help. Review of films with discrepancy in interpretation may be beneficial. The same may also apply to ECG. It may not always possible in busy ED to use bedside USG but use of USG in some cases may be beneficial in making more specific and accurate diagnosis.

Use of the observation ward may also help improve the accuracy of ED diagnosis. The observation wards may be useful for conditions without clear diagnosis even after testing. Diagnostic accuracy may be improved if patients can be observed and reassessed a second time.

Simple investigations like X-ray, ECG, and blood test are not that helpful in improving the ED diagnostic accuracy. In order to improve the accuracy, history taking and physical examination are the two armamentariums. Thus it is fundamental for all doctors working in ED to master the skill and art in performing history taking and physical examination. A reputed professor once coined that "diagnosis could be arrived at simply by good history taking and physical examination in 80% of patients"

Conclusion

There are definite areas for improvement on ED diagnostic accuracy, especially in non-traumatic cases, children and the elderly. Simple investigations available at emergency department were not very useful and better training in indication and interpretation is required. Good clinical assessment, history taking and physical examination remain the

most important diagnostic tools in diagnostic accuracy for emergency physician.

References

1. Validity of admission diagnosis as process- driving criteria: influence on length of stay and consultation rate in emergency departments. 2013 Aug; 62(8):617-23. Doi: 10.1007/s00101-013-22-07-5. Epub 2013 Aug 7.
2. Amitabha Chattopadhyay, Ritu Ghosh, Tanim Das, Sandipan Chakroborty, Subhadeep Paul, Saibendu Kumar Lahiri. Gap analysis between provisional diagnosis on admission and final diagnosis during discharge –A comparative study. IOSR Journal of dental and medical science (IOSR- JDMS). 2013 May-June; 8(1).
3. Comparison of presenting complaints vs. discharge diagnosis for identifying "non emergency" Emergency department visit. JAMA, 2013 March 20; 309(11).
4. Hassan AMIRI, Samad Shams Vahdati, Nilofar Ghodrati, Ali Irandoust, Hosna Sadeghi, comparison of presumptive diagnosis in emergency Department and the final diagnosis in the wards. Turk J Emerg Med 2010; 10(4):164-168.
5. HS chiu, KF Chan, CH chung, K ma, KW Au. A comparison of emergency department admission and discharge diagnoses: retrospective study. Hong Kong j. Emerg. Med. 203 April; 10(2).
6. GH Lim, E Seow, G koh, D tan, HP Womg, Study on the discrepancies between the admitting diagnoses from the emergency department and the discharge diagnosis. Hong Kong j. Emrg. med 2002 April; 9(2).