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Discrepancy between hospital discharge diagnosis and emergency department admission diagnosis

Abstract

The objective is to investigate the matching between emergency department and discharge diagnosis as well as how investigations affect accurately of emergency department diagnosis. The study was conducted retrospectively over a six-month period. Setting: The emergency department Department at king Saud medical (KSMC), including four in-patient specialties: orthopedics, surgery, and medicine. Subjects: All patients that entered the emergency room during the study period. The correlation degree of hospital discharge diagnosis and admission diagnosis serve as the primary outcome markers. Results: 72% of diagnoses at admission completely or partially matched diagnoses at discharge. Young people, and traumatized cases had significantly superior diagnosis accuracy, according to data. The diagnostic accuracy was impacted by the specialization department and the investigations done. In conclusion, the physical examination and history are still the two most important diagnostic techniques employed in the emergency room. Simple tests available in the ER were frequently ineffective at improving diagnostic accuracy.

Keyword : Diagnosis, patients, hospital, X-ray, blood tests, electrocardiography

23 **Introduction**

24 There are significant clinical, monetary, and legal ramifications in the event of a discrepancy,
25 making it challenging to maintain a high accuracy rate between admission and discharge
26 diagnosis. One of the primary consequences of inconsistent diagnosis is the prolongation of
27 hospital stays (Johnson et al., 2009). The process of diagnosis entails identifying the illness that
28 is the source of a patient's symptoms and warning signs. Investigations, the physical
29 examination, and the history all play a significant role in making a successful initial diagnosis.
30 Investigations were frequently conducted throughout the procedure. It enables the medical
31 professional to select the optimal treatment option and prognosis. The diagnosis determined at
32 the admission time forms the basis of the doctors' initial treatment plan, which also explains why
33 some patients receive several types of care throughout their hospital stay. When a different
34 diagnosis is made while the patient is in the hospital, it could result in complaints from the
35 patient and legal action. (Leape et al., 1991).

36 Inadequate investigations and administrative mistakes are among the factors contributed to the
37 diagnosis being insufficient at admission time (Chiu et al., 2003). The initial diagnosis for a
38 patient admitted from emergency department is frequently made based on the patient's entry
39 presentation, clinical examination, and laboratory investigations. Additionally, the original
40 diagnosis might not match the one offered by the doctors who admitted the patient to the ward.
41 As a result, the diagnosis could change while the patient is in the hospital, especially in
42 complicated circumstances, leading to a new discharge diagnosis (McNutt et al., 2012).

43 More than 10 percent of patients admitted from the emergency department to inpatient care in
44 GH Lim et al., 2003 study exhibited discrepant (unmatched) diagnosis (Lim et al., 2002).
45 According to a different study, orthopedic patients, diagnosis accuracy was 76%, and for surgical
46 patients, it was 90.3%. (Chiu et al., 2003). According to Pakistani retrospective study which was
47 conducted in a tertiary hospital, mismatched diagnoses made in medicine department through
48 emergency department was 41% in 1995, 37% in 2000, and 14% in 2007 (Shahid et al., 2012).

49 The goal of our study was to identify diagnostic discrepancies frequency between hospital
50 discharge and emergency department diagnoses. Additionally, we sought to understand the
51 patient and diagnostic characteristics that lead to increased rate of diagnostic mismatch same as
52 the impact of various investigation types on the accuracy of the diagnosis.

53 **Objective**

54 The objective is to investigate the matching between emergency department and discharge
55 diagnosis.

56 how investigations affect accurately of emergency department diagnosis.

57 **Method**

58 March through August in 2021 were the six randomly selected months. Retrospective computer
59 data of every patient admitted from the KSMC's ER department to the medical, surgical, and
60 orthopedic departments were examined. This review covered the months of March 2021 to May
61 2021, in this selected period of time there is 2278 admissions to selected departments which
62 includes medicine, surgery and orthopedic.

63 It was investigated how specific the emergency department doctors' provisional diagnoses were.
64 A diagnosis was considered to be precise if it identified a specific disease process affecting one
65 or more distinct organ or structure. For instance, chest discomfort was not thought to be
66 particular although peritonitis was. This concept took into account the emergency departments
67 operational constraints. For instance, determining whether upper gastrointestinal bleeding is
68 coming from the oesophagus, stomach, or duodenum may be impossible for emergency
69 department clinicians. The degree of agreement between the emergency department diagnosis
70 and discharge diagnosis was used to gauge accuracy.

71 Full match meant that the discharge diagnosis agreed with the emergency department diagnosis,
72 regardless of whether it was specific or not. When the ED diagnosis and the discharge diagnosis
73 were only partially in agreement, this is known as a "partial match." For example, when an acute
74 appendicitis emergency department diagnosis partially matched a discharge diagnosis of caecal
75 diverticulitis, (More information will be given in the section on the results). The authors
76 considered every possible "partial match" scenario before coming to their conclusions. When
77 there was no connection between the admission diagnoses and discharge one, it categorized as
78 "unmatch."

79 The impacts of age, sex, medical specialization, and the type of emergency department
80 examination (including X-ray, blood tests, urinalysis with reagent strips, electrocardiography,
81 and ultrasonography) on the accuracy and level of diagnostic matching were evaluated. Version
82 24 of SPSS was used to process and analyze the data. For assessing hypotheses, the chi-squared
83 test and t test were used.

84 **Results**

85 The study had 2278 admissions in total. Ages ranged from under a year to 102 years (mean 49,
86 median 57). The diagnostic accuracy was shown to be considerably higher in the younger age
87 group when the adult patients were divided into groups by age (18-63 years versus 64 years or
88 above, p value less than 0.001). The ratio of men to women was 1.38:1. Males were much
89 younger than females in terms of age (female mean age 53, male mean age 46, p value less than
90 0.001). Significantly improved specificity and matching were linked to male sex (p value less
91 than 0.001).

92 The medical department was visited by the majority (52.9%). The remainder were admissions to
93 the surgical department (18%), and orthopedic department (12.7%) and rest department was
94 excluded. 54.2% of cases were classified as urgent (Category 3), while 36.4% were less urgent
95 (Category 4). Only 10.4% were due to trauma. Among the diagnoses given upon emergency
96 department admission, 67.7% were specific, and 71.6% were a complete or some match with the
97 diagnoses given at discharge. Due to our inherent constraints, ED doctors were unable to make
98 exact diagnoses, hence they were considered to be only matched partially with the final
99 diagnoses. For instance, even though an intestinal obstruction could be clearly diagnosed in
100 emergency department, the underlying reason would typically be impossible to identify through
101 clinical means. Another reason for awarding a partial match to an emergency department
102 diagnosis was that emergency department clinicians occasionally preferred to make an open
103 diagnosis that was less specific but yet informative enough to move forward with additional
104 research and care. As a result, diagnoses such as chest illness, hip fracture, and injuries to the
105 finger, leg, or foot were considered partial matches.

106 If a particular provisional diagnosis was made in the emergency department (ED), there was a
107 significantly higher chance of having a full or partial match of diagnosis (83.4% versus 46.9%,
108 p0.001) (Table 1). In traumatic situations, the diagnosis' accuracy was statistically higher (85%
109 versus 70.2%, p 0.001). (Table 2)

110 Figure 1 displays the diagnosis accuracy across several specialties. Table 3 displays the use of
111 investigations for cases that were accepted to the ED.

112 Table 4 displays having blood work done (most commonly a complete blood picture, or CBC)
113 considerably increased the diagnosis' accuracy (p value=0.03). Surprisingly, for medical
114 admissions, those without an ECG or an X-ray had far higher accuracy (p less than 0.001). Blood
115 testing had no significant effect on the matching. There was no discernible difference between
116 patients who underwent ED investigations versus those who did not, for surgical and orthopedic
117 admissions.

118 Table 1. Matching by specificity of emergency department diagnosis (p<0.001)

	Full or partial match	Not matched
Specific diagnosis	1457 (83.4)	290 (16.6)
Non-specific diagnosis	390 (46.9)	441 (35.1)

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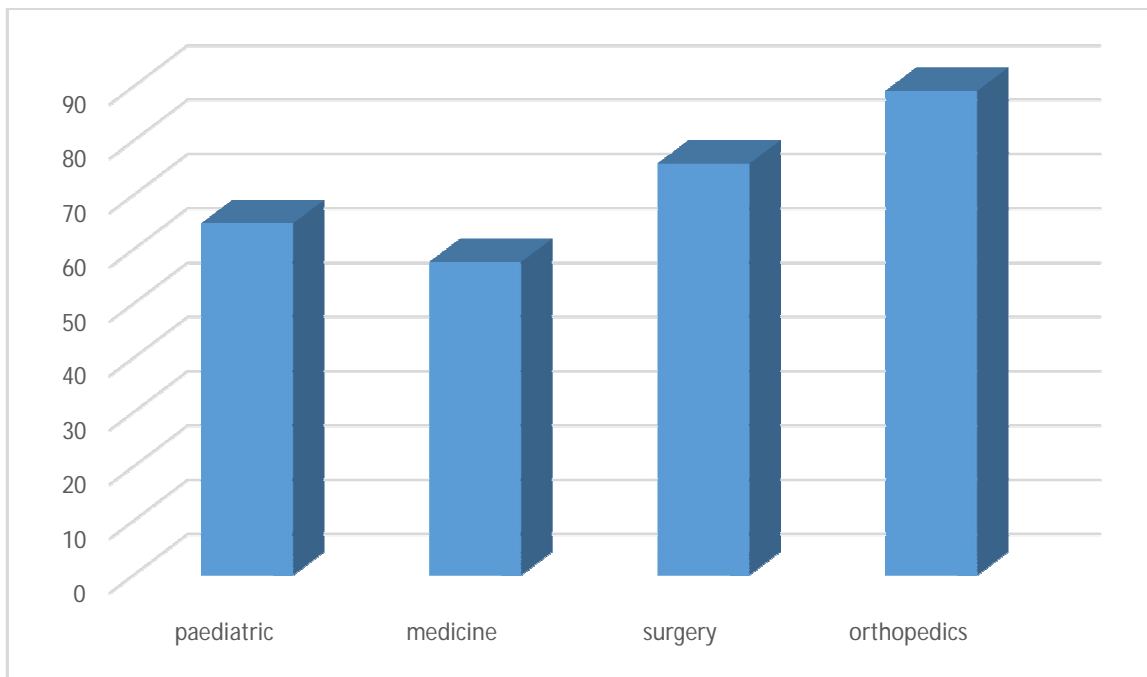
120 Table 2. Matching between patients with trauma and patients without trauma (p<0.001)

	Full or partial match	Not matched
Trauma	220 (85)	39 (15)
Non-trauma	1627 (70.2)	692 (29.8)

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123 Figure 1. Accuracy of admission diagnosis in each specialty



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128 Table 3. Frequency and (percent) of investigations used in each case type

	X RAY	Blood Investigations	Electrocardiography	Urine analysis	Ultrasound
	1118				
Medical	81.9	709 (51.9)	791 (57.9)	69 (5)	5 (.3)
Surgical	269 (57.9)	176 (37.9)	52 (11.2)	52 (11.2)	38 (8.1)

Orthopedic	679 (85.8)	181 (22.8)	459 (58)	19 (2.4)	4 (.5)
Total	2166	1066	1302	140	47

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131 Table 4. Effect of investigations on accuracy of diagnosis

	X RAY	Blood Inv.	Electrocardiography	Urine analysis	Ultrasound
	P value				
Medical	0.001*	Not S.	P value 0.001*	Not S.	Not S.
Surgical	Not S.	P value 0.05	Not S.	Not S.	Not S.
Paediatric	Not S.	Not S.	Not S.	0.05*	Not S.
Orthopedic	Not S.	Not S.	Not S.	Not S.	Not applicable

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* indicate negative effect on diagnosis accuracy

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Inv. Investigations

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136 Discussion

137 This was the first and largest local investigation on the relationship between hospital discharge
138 diagnosis and emergency department admission diagnosis. Only a few similar research have
139 been published in the international literature. In order to ascertain the frequency of missed
140 diagnoses at the emergency department at King Fahd Hospital of the University (KFHU) in
141 Khobar, Saudi Arabia, as well as the pertinent causes, a retrospective cohort research was
142 conducted there in 2009. According to their analysis, missed diagnoses made up 8% of cases,
143 fully/partially matched diagnoses were 62%, unmatched diagnoses were 10%, and symptoms &
144 unspecific diagnoses made up 18%. Interns encountered a high percentage of fully/partially
145 matched diagnoses (65%) compared to consultants' high percentage of unmatched diagnoses
146 (26%) (El-Mahalli and Mokhtar., 2009).

147 In contrast to X-rays, which negatively affect diagnostic quality in the medicine department, our
148 study indicated that blood investigations increased diagnosis accuracy in emergency surgical
149 situations. Accuracy may also improve as you gain more experience interpreting X-rays. Over-
150 interpretation, which could be caused by a combination of insufficient information gleaned from
151 the patient's medical history and a lack of experience reading X-rays, could be used to explain
152 the current study's findings regarding the potential detrimental effect of X-rays on diagnostic
153 accuracy. While examining X-rays, radiologists occasionally request extra clinical data in order
154 to do "clinical correlation" and determine the most likely diagnosis. Prior to a patient's final
155 disposition, senior on-site doctors or even radiologists may be consulted. (George et al., 1992;
156 Fleisher et al., 1983; Preston et al., 1998).

157 Li et al., 1995 found a diagnosis error rate of only 4%, their study relied on the initiative of the
158 inpatient specialists to get feedback. The current study may act as a motivating point for future
159 investigations into the accuracy of emergency department diagnoses, clinical audits, or other
160 quality assurance activities. Overall, especially in the orthopaedic speciality, the level of
161 specificity and matching attained was satisfactory. But there is always room for development,
162 particularly for geriatric patients. The specific requirements and diagnostic quirks of emergency
163 problems in elderly people should be covered in emergency medicine training, as some writers
164 have noted (Kizer and Vassar, 1998); McNamara et al., 1992).

165 Patient history and clinical examination are the two tools that one may use to increase the
166 accuracy of an ED diagnosis because straightforward investigations like X-rays, bedside
167 urinalysis, electrocardiography, and blood tests are not that helpful in doing so. [According to a
168 study by Hampton and colleagues, 83% of diagnoses in outpatient medical care were based on
169 the patient's history](#) (Summerton, 2015). Therefore, it is crucial for medical professionals working
170 in the ED to learn the ability and art of doing a physical examination and taking a history
171 effectively.

172 Conclusion

173 Improvements in ED diagnostic accuracy are definitely needed, particularly for nontrauma
174 situations, young patients, and the elderly. Better training in indicators and interpretations is
175 necessary because it was discovered that the straightforward investigations offered at emergency

176 departments were useless and even misleading. The most crucial and fruitful diagnostic methods
177 for emergency physicians continue to be the patient history and clinical examination parts of
178 good clinical evaluation approaches.

179

180 **Consent**

181 As per international standard or university standard, patient(s) written consent has been collected
182 and preserved by the author(s).

183 **Ethical Approval:**

184

185 As per international standard or university standard written ethical approval has been collected
186 and preserved by the author(s).

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