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Original Research Article

On-line medical direction (OLMD) occurrence in non-transported emergency medical service (EMS) calls in Riyadh, Saudi Arabia

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Abstract

The primary objective of this retrospective descriptive study is to determine the percentage of on-line medical direction (OLMD) contact occurrence and the patients' chief complaints in non-transported Emergency Medical Service (EMS) calls in Riyadh, Saudi Arabia. Data were obtained from EMS patient care reports (PCRs) of non-transported calls from 10 EMS stations for 3 consecutive months. Overall, 7,178 emergency calls were made to the 10 EMS centers. There were 1,791 non-transported calls. PCRs from cancelled calls, deceased patients, patients not found, and those lacking a station number were excluded. The remaining 1,219 calls satisfied the inclusion criteria. The categories of non-transported calls were medical, trauma, and not specified (NS). Medical cases represented the highest proportion of non-transported calls with 679 cases (55.7%). Trauma cases comprised 271 calls (22.2%), while 269 (22%) non-transported calls were not specified. The chief complaints of non-transported calls were normal medical patient (42.7%), fainting (24%) and shortness of breath (24%). OLMD contact did not occur in the majority of non-transported calls (761, 62.5%). Only 321 calls (26.3%) involved OLMD contact. The occurrence of contact was NS in 137 calls (11.2%). In conclusion, this study reveals that OLMD contact occurred in a limited percentage (26.3%) of non-transported calls. OLMD contact did not occur in the vast majority (62.5%) of non-transported calls. This study recommends the revision of the medical director role and its associated responsibilities, the establishment of a mandatory technological reporting system, a quality review of the non-transported calls' PCRs, and strict measures regarding patient refusals and/or non-transportation.

Keywords: EMS, non-transported calls, on-line direction

Abbreviations:
EMS: emergency medical services
EMT: emergency medical technician
OLMD: on-line medical direction
SRCA: Saudi Red Crescent Authority
PCR: patient care report

INTRODUCTION

On-line medical direction (OLMD) as a significant role of medical direction is signified in the United States Emergency Medical Service System (US EMSS) Act, which was introduced in 1973. Under this legislation, emergency medical technicians (EMTs) must act under the supervision of a licensed physician and/or medical

director (Stone et al., 2000). The medical director is usually an emergency medicine physician with an EMS fellowship. An essential role of the medical director is OLMD during the provision of the emergency medical care. OLMD is defined by Wuerz et al. (1995) as communications that link an EMS care provider with a hospital base station. Williams et al. (2006) and Erder et al. (1989) identified OLMD as a real-time interaction between a physician and EMS providers to discuss patient treatment intervention.

In Saudi Arabia, EMS is rendered by the Saudi Red Crescent Authority (SRCA). A large number of EMS calls result in patients not being transported (Alrazeeni, 2016). Non-transported EMS calls refer to those made to an EMS dispatch center that result in an emergency vehicle being dispatched to the scene, but the patient is not transported to a medical facility (Alrazeeni, 2016).

To date, no medical director has been appointed for the EMS system of the SRCA (Al-Mutairi, 2006). The approach implemented is to recruit EMS physicians to undertake many technical and administrative responsibilities, including OLMD. This study considers the number of times that physicians were involved via OLMD in the transport of distressed patients.

The significance of the study lies in the understanding that non-transported calls might ultimately affect the quality of EMS provision, and how efficiently EMS could have been provided to the distressed patients. Non-transported EMS calls carry a higher risk of morbidity and consequently subsequent litigation and legal action (Selden et al.,1990; Chen et al., 1996). In many of these non-transported calls, patients might have refused transport or have been denied transport by EMS staff. OLMD contact is important in taking good emergency medical care of the patient and making beneficial transportation decisions.

Little research has been published regarding OLMD in EMS in Saudi Arabia. Moreover, most of the published literature is relatively old. In a recent study by Alrazeeni (2016), more than half of the non-transported emergency calls at the SRCA EMS system were reported as refused by the patient or a relative. Wuerz et al. (1995) measured the frequency with which OLMD contact resulted in a medical instruction. They concluded that OLMD played an important role in providing quality EMS care because most of the medical instructions in their study resulted from OLMD contact. In a study by Studnek et al. (2009), nearly two-thirds of EMS professionals in the US EMS system reported having direct medical director contact and benefiting from it.

Some EMS systems replace OLMD contact with standardized chief complaint-based protocols for the EMTs to follow (Klein et al., 1997). Rottman et al. (1997) conducted a prospective study to examine the effect on quality of care resulting from this replacement. No significant improvement was noted in the system's performance involving chief complaint-based protocols over OLMD. Tortella et al. (1995) found that medical directors were contacted in 165 EMS systems. Providing Advanced Life Support (ALS) services and using medication necessitates OLMD contact with the medical director.

Burstein et al. (1998) found that contact with a medical-control physician appears to markedly improve the transport rate for patients who initially attempt to refuse out-of-hospital medical care. This is especially true when physicians are more assertive in recommending transport. Shaw et al. (2006) showed that the processes leading to refusal to travel and non-transportation to the hospital were complex. Interacting factors are involved, including medical, emotional, and social factors. The study suggested that a system that facilitates standardized recording of "refused to travel" information needs to be designed.

A study in North America by Shaw et al. (2006) revealed that, of patients who were not transported because of either patient refusal or that of EMS paramedics, almost half required further medical attention. A study by Gardner (1990) showed that 36% of cases were not in need of emergency assistance by EMS. In the UK, Palazzo et al. (1998) stated that approximately 16% of emergency calls were inappropriate. Another study by Kahale et al. (2006) suggested that, even in cases where transportation was refused by paramedics, evidence exists that most of these clients did not require immediate or urgent medical care.

The primary objective of this study is to determine how much OLMD contact occurs in non-transported EMS calls in Riyadh, Saudi Arabia. The secondary objective is to determine to how much OLMD contact occurs for certain chief complaints of patients in non-transported calls.

METHODOLOGY

Study Site

The site of the study was the Saudi Red Crescent Authority (SRCA), EMS system. The study focused on data extracted from EMS patient care reports (PCRs) regarding non-transported emergency calls obtained from 10 EMS stations distributed throughout the city of Riyadh, Saudi Arabia. The EMS stations were stations number 1,3,6,12,16,19,21,22,24 and 26. The study was conducted for the period of 3 consecutive months (March, April, and May 2014).

Study Design and Data Collection

The present study was a retrospective descriptive study. Data on significant variables were extracted from the PCRs to answer the questions of this study. This included patient conditions and whether there was a medical direction contact prior to the decision to not transport the patient by each EMS unit. The cases were categorized as

medical or trauma. The occurrence of OLMD contact was determined. Patient medical conditions were categorized based on the chief patient complaint. The type of case was cross-tabulated with OLMD contact for all calls. Additionally, patient chief complaints were cross-tabulated with OLMD contact for all calls.

Inclusion and Exclusion Criteria

All PCRs of calls require patient care and medical direction advice were reviewed and analyzed. Data related to "cancelled," "not found," or "deceased patient" calls were excluded from the analysis. These calls did not require patient care and medical direction advice. In addition, any unavailable information was noted.

Data analysis

A descriptive analysis of the data was conducted using the Statistical Package for Social Sciences (SPSS) version 22 (IBM SPSS, IBM Corporation, Armonk, New York, USA). Cross-tabulation was chosen for the analysis and manipulation of the data set. This tool is thought to generate acceptable answers for the research objectives. After collecting the PCRs, we carefully examined the various types of information, and then we selected certain variables for coding.

In the analysis of the data, the magnitude of each type of case and the chief complaint in non-transported calls were determined. In addition, OLMD contact was cross-tabulated with non-transported calls to obtain the percentage of the occurrence or non-occurrence of OLMD.

Ethical considerations

For this study, a formal ethical board review and study approval were granted by the research center in Prince Sultan College for EMS (PSCEMS) at King Saud University. Based on this approval, a formal letter to request data from the SRCA was mailed. The responses from the SRCA training department and the Riyadh SRCA branch were positive. Accordingly, a large number of paper forms (PCRs) were provided to the researcher.

It was understood that the collected PCRs are official documents that belong to the SRCA EMS management. They contain confidential information about patients, service providers, and the system itself. Measures to maintain and protect the confidentiality of the information were taken during this study. The PCRs were stored in the primary researcher's office at all times. Documents regarding non-transported calls were separated for each EMS station, and kept in sealed envelopes. PCRs for each month were marked and stored together. Ten envelopes were received. The only location of data entry was a meeting room. All PCRs were returned to the SRCA after the information was extracted.

RESULTS

In the initial analysis of the results, 1,791 emergency calls were reported as non-transported. Of these, 401 (22.38%) were cancelled by dispatch before arrival at the scene. In addition, in 91 (5.08%) calls, the patient was found dead upon arrival at the scene. In 88 (4.91%) calls, the patient was not found. Almost all of the PCRs relating to the cancelled calls, the not found-on-scene patients, and deceased patients were more than 90% incomplete. Therefore, these PCRs were excluded from the analysis. Among the remaining 1,390 (77.6%) non-transported calls, there were 171 (8.8%) that did not include the station number, and they were also excluded. This resulted in 1,219 calls that satisfied the inclusion criteria. However, some data were missing from these PCRs.

Non-transported call cases

In figure 1, the type of case includes 3 different categories of non-transported calls; these were medical, trauma, and not specified (NS). Medical cases represented the highest proportion of non-transported calls with 679 cases (55.7%). Trauma cases were the subjects of 271 calls (22.2%), while 269 (22%) non-transported calls were not specified.

Chief complaint patient distribution

Figure 2 shows specific categories of the chief complaints of calls that were non-transported. With regard to chief complaints, normal medical patients represented 42.7% of all non-transported calls. Chief complaints of fainting represented 24% of all non-transported calls. Chief complaints of shortness of breath represented 24% of all non-transported calls. The remaining calls included other chief complaints of coma (6.5%) and heart attack (4%).

The percentage of OLMD contact occurrence

Figure 3 shows that OLMD contact did not occur in the majority of non-transported (761) calls (62.5%). Only 321 calls (26.3%) reported OLMD contact. The occurrence of contact was not specified in 137 calls (11.2%).

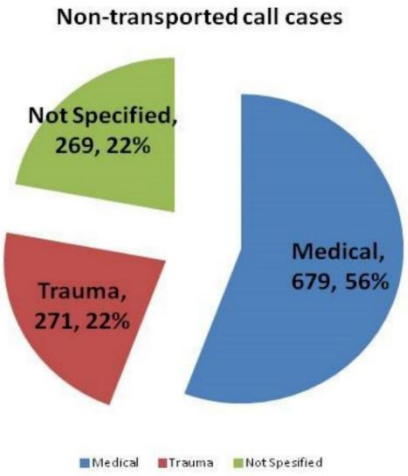

Figure 1. Non-transported call cases

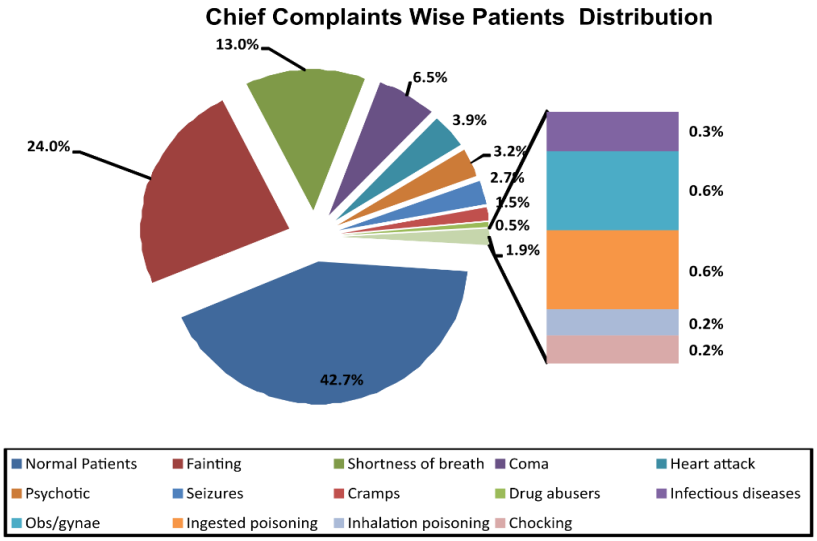

Figure 2. Chief complaint wise distribution of non transported calls

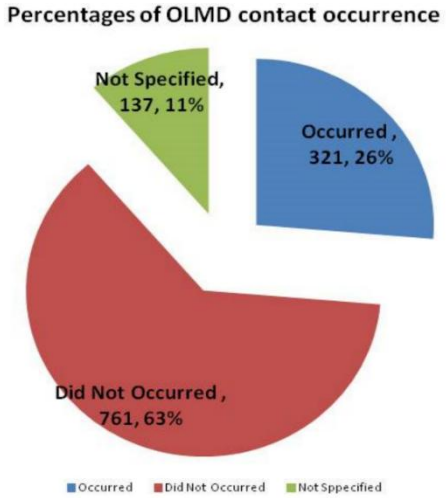

Figure 3. The percentage of OLMD contact occurrence

DISCUSSION

Wuerz et al. (1995) confirmed that OLMD plays an important role in providing quality EMS care because it results in medical instructions. In this study, OLMD contact prior to the patient transportation decision occurred in only a very limited number of the non-transported calls reviewed. According to our results, OLMD contact did not occur in the vast majority of non-transported calls (761, 62.5%). OLMD contact was reported to occur in only 321 calls (26.3%). To date, no medical director position has been appointed for the EMS system in the SRCA (Al-Mutairi, 2006). The approach implemented is to recruit EMS physicians to conduct many technical and administrative responsibilities, including OLMD. In addition, the direct contact between emergency physicians in different emergency rooms (ERs) occurs very rarely. This explains some of the existing communication and inter-facility problems between the receiving hospitals and EMS units.

Burstein et al. (1998) showed that contact with a medical-control physician improved the transport rate for patients who initially refuse EMS care. If this were the case with the calls reviewed, it would positively influence the decision regarding non-transported patients. In our results, the chief complaints of non-transported patients were normal medical patient (42.7%), fainting (24%), shortness of breath (24%), coma (6.5%), and heart attack (4%). Initiating medical contact might influence non-transportation decisions in these calls. The absence of OLMD advice raises concerns about the quality of patient assessment and the care provided to these patients. Considering the large number of non-transported critical patients among the above cases, it is very important to implement a system to determine whether a quality review of these PCRs for such cases is required.

OLMD contact with a physician can be replaced by standardized protocols (Klein et al., 1997). Protocol guidance is common practice in EMS. Some reports have claimed that there is no significant improvement in using chief complaint-based protocols over OLMD. Rottman et al. (1997) and Klein et al. (1997). Nonetheless, the up-to-date provision of EMS based on protocols does not exist in the EMS in Saudi Arabia. EMS providers rely only on their initial training.

As described previously, Shaw et al. (2006) revealed that half of patients who refused EMS required further attention. Gardner (1990) moreover asserted that 36% of patients were not in need of emergency assistance from EMS. In the UK, (Palazzo et al., 1998) revealed that only 16% of emergency calls made were inappropriate. Kahale et al. (2006) indicated that most non-transported patients did not require immediate or urgent medical care. Shaw et al. (Shaw et al., 2006) asserted that medical, emotional, and social factors are all involved in the “refused to travel” decision. This study did not follow-up non-transported patients or access patient information to determine the status of the patient immediately after the call. In addition, EMS physicians were not interviewed in this study. However, we recommend that such studies are conducted in the future.

Upon analysis of all reviewed PCRs, a common negative characteristic was observed; there was incomplete critical information in the PCR documentation completed by EMS providers. Therefore, the establishment of a technological reporting system for more effective systematic data entry and management is required. We will also conduct a separate future study to analyze the ineffectiveness of documentation in the SRCA EMS. Additionally, strict measures regarding patient refusals and/or non-transportation either by the patient or by the EMS providers must be in place.

Documenting EMS calls thoroughly in the PCRs is essential for the quality of service. PCRs are legal written records of the incidents, and are important requirements for professionalism, medical auditing, quality improvement, and data collection. With the current ineffective method of documentation in SRCA EMS, these functions may not be achieved by the existing system.

Finally, this study reveals that there is a need for a revision of the SRCA EMS system with regard to the medical director, their role and responsibilities, and the promotion of their positive involvement in EMS provision.

CONCLUSION

This study reveals that OLMD contact occurred in a limited percentage (26.3%) of non-transported calls. OLMD contact did not occur in the vast majority (62.5%) of non-transported calls.

A major deficiency in the completeness of EMS documentation was also revealed. This study recommends the revision of the medical director role and its associated responsibilities, and the establishment of a mandatory technological reporting system for more effective data entry and management.

Additionally, a quality review of the non-transported call PCRs for critical cases is recommended. Furthermore, strict measures regarding patient refusals and/or non-transportation either by the patient or by the EMS providers must be in place.

This study divulges that OLMD contact occur in a limited proportion of all non-transported calls in EMS system in Riyadh, Saudi Arabia.

Limitation of the study

The major limitation of this study is an anticipated incompleteness of large number of the collected PCRs resulting in large proportion of missing data. Another challenge comes in the incapability to read some of individual hand writing of those reports.

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Conflicts of Interest

The authors declare that there are no conflicting interests with respect to this project.

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