Expanding IV Fluid and Glucose Infusion without Direct Medical Control: A Pilot Trial for Emergency Medical Technicians in Gyeonggi Province, Korea

Joo Yeong Kim, Sung Woo Moon, Jong Hak Park, Han Jin Cho
Department of Emergency Medicine, Korea University Ansan Hospital, Korea

Corresponding Author: Sung Woo Moon (youngmd@ajou.ac.kr)

In Korea, Emergency Medical Technicians (EMT) are allowed to access intravenous (IV) fluid or glucose infusion only under direct medical control. The aim of this pilot trial is to confirm the feasibility that qualified EMTs are capable of IV fluid and glucose under indirect medical oversight. This is a pilot intervention ultimately preparing evidence for expanding EMT’s legislated work scope. To be safe, only level 1 EMTs or nurses who experienced hospital-based clinical course or procedure workshop were qualified to participate in the trial. Data on cases of potentially indicated for IV access was collected using EMS run sheet from June to July 2014. Protocol for each IV fluid and glucose infusion was disseminated through education. To monitor complication and evidence after the procedure, registry was collected for each IV fluid and glucose infusion. To compare the incidence, we retrospectively reviewed 2013 EMS run sheet data. From June to July 2014, qualified EMT transferred 20,573 patients. Excluding cardiac arrest (N=234), age >18 years (N=2,074) and those not indicated for IV (N=2,071), 1,245 cases were indicated for IV fluid and 16,026 cases for IV glucose infusion. Among them 41 (3.3%) cases had IV fluid infusion and 119 cases (0.7%) had glucose infusion without direct medical control. If we compare with same period in 2013, 3 cases out of 1,057 cases had fluid infusion and 9 cases out of 16,980 cases had IV glucose infusion without direct medical control. From 128 cases of collected registry, 114 cases (89.3%) succeeded IV in second trial. Most common obstacle in IV was lack of manpower (5.3%) and 66.4% denied any obstacle. No critical complication was reported from the pilot trial. We may suggest that expanding IV fluid and glucose infusion is feasible in qualified EMTs. Further investigation is needed.

Effect of Emergency Medical Services (EMS) Education Program of Fire Station for Medical School Students

Seung Min Jeon*
Sangdae Fire House, Jinju Fire Station, Korea

Corresponding Author: Seung Chon Kim (gsimem@naver.com)

The effect of EMS education for medical college or school students is unknown in Korea. This research was conducted to investigate the effect of systematically developed EMS education program of Fire Station for medical school students. EMS education program of Fire Station for medical school students was developed before the beginning of new semester. Each small group composed of 4 or 5 students visited Jinju Fire Station every other week. A level-1 emergency medical technician (EMT) who was an EMS quality improvement officer performed 2-hour practice session every student participated in the before-and-after protocol survey which was designed to investigate the effect of EMS education program of Fire Station. Among 46 medical school students who participated in EMS education program, 23 (50.0%) were male, and the mean age was 28.3 years old. 19 (41.3%) students had a experience of 119-EMS call or 119-ambulance use. Only 10 (21.7%) and 5 (10.9%) students had IV fluid infusion and 119 cases (0.7%) had glucose infusion without direct medical control. If we compare with same period in 2013, 3 cases out of 1,057 cases had fluid infusion and 9 cases out of 16,980 cases had IV glucose infusion without direct medical control.

Evaluation of Pre-hospital Triage Performed by 119 Rescuers

Byunkyung Lee, Seung Chon Kim*
Department of Emergency Medicine, Gyeongsang National University School of Medicine, Korea

Corresponding Author: Seung Chon Kim (gsimem@naver.com)

It is essential for establishing an effective emergency medical services (EMS) system that EMS providers transport patients to the appropriate hospitals according to their severities. This study was conducted to investigate the appropriateness of pre-hospital triage performed by 119 rescuers based on the results of emergency department (ED) management. Patients transported to a tertiary academic hospital ED by 119-ambulance between July 2012 and June 2014 were included. Patient classification on 119-Run Sheet including “emergent”, “sub-emergent”, “potential-emergent”, “exclusive”, and “dead” was regarded as pre-hospital triage. ED results and Emergency Severity Index (ESI) levels according to pre-hospital triage were retrospectively surveyed. An “emergent” patient on 119-Run Sheet whose ED result was discharge home or ESI level was 3 or more was defined as over-triage. A “potential-emergent” or “exclusive” patient whose ED result was hospital admission or death, or ESI level was 1 was defined as under-triage. Length of stay (LOS) in ED according to pre-hospital triage was analyzed by one-way ANOVA. Among 9,731 patients transported by 119-ambulance during the study period, 7,977 patients were included because 1,754 patients had incomplete data. The mean age was 55.7 years old, and 4,800 (62.7%) patients were male. Patient classifications on 119-Run Sheet included 4,759 (69.7%) “emergent”, 1,697 (21.3%) “sub-emergent”, 1,334 (16.7%) “potential-emergent”, 97 (1.2%) “exclusive”, and 93 (1.1%) “dead”. Over-triage and under-triage rates according to ED result were 40.3% and 29.4% respectively. Over-triage and under-triage rates according to ESI level were 66.2% and 11.5% respectively. LOS in ED were 11.5 hours in “emergent”, 9.7 hours in “sub-emergent”, 8.0 hours in “potential-emergent”, and 8.1 hours in “exclusive” (p<0.001). Over-triage and under-triage rates based on ED results and ESI levels were relatively high. LOS in ED was significantly longer if pre-hospital triage was more severe. It is necessary to implement a more appropriate pre-hospital triage method which may correlate with ED management.

Development of Scoring System for Screening Pulmonary Tuberculosis in Vulnerable Patients Who Visited Emergency Department

Ki Bong Baek, Jong Hwan Shin*, Hui Jae Lee, Young Ju Son, Ji Seon Soo, Ki Jeong Hong, Jin Hee Jeong
Department of Emergency Medicine, College of Medicine, Seoul National University, Seoul, Korea

Corresponding Author: Jong Hwan Shin (iskythin@naver.com)

Korea ranked the first place among the OECD countries, on the prevalence, incidence, and mortality of TB in 2011. As a result of socio-economic development and public health improvement, the prevalence of active pulmonary TB in Korea was reduced from 5.1% in 1985 to 0.9% in 1995. The prevalence of TB among the homeless was 6.4% in US and 7.1% in Korea compared to general population group. The aim of this study is to develop predicting indicator of TB by analyzing homeless people who visit the public hospital emergency department (ED). We analyzed 7500 homeless patients who visited the public hospital ED from Jan. 1, 2001 to May 31, 2014. TB patient was defined by at least one of the following. TB diagnosis code at discharge, TB medication, AFB (+) and history of active TB. 302 homeless patients were recruited through the operational definition of TB. We conducted multivariate analysis of clinical variables obtained from initial check list and later lab analysis, and made scoring system by weighting each variable. Then applying this scoring system, the AUC of ROC curve was calculated. Initial Meaningful predictor variables were hypotension, tachycardia or bradycardia, no alcohol intoxication, history of TB, no DM and homeless registered patient. Later Meaningful predictor variables were tachycardia or bradycardia, history of TB, homeless registered patient, hyperglycemia (>150 mg/dL), hyperalbuminemia (-3.3 g/dL) and CPP elevation (>0.5 mg/dL). The AUC of ROC curve from initial scoring system and later scoring system including lab findings were 0.718 and 0.783. We developed a novel scoring system for screening TB patients in vulnerable social group who visit the ED. We can early detect potential TB patients and effectively control TB, moreover prevent to spread TB in medical group and uninfected people. Prospective multicenter study is needed by using the scoring system of TB among the homeless.