Is It Time to Review our Educational Program for the Electrocardiography Operators?

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Electrocardiography (ECG) is one of the imperative diagnostic tools in cardiology. In spite of considerable advances in imaging and diagnostic methods in cardiology, ECG has still maintained its crucial role in the diagnosis of variant problems and pathologies; moreover, it would be so helpful in guiding rapid and appropriate therapies in the field of cardiology and internal medicine [1-4]. Accordingly, performance of correct and standard ECG is an inevitable need for each health system; missing the probable errors in ECG and inability to correct them may lead to unfavorable outcomes including misdiagnosis and inappropriate treatment [4-7]. This pilot study was conducted to evaluate the familiarity of ECG operators with essential points of ECG-performance.

In the current pilot study, ECG operators were interviewed by an educated student. All of the questions were similar to each operator and they were asked subjective questions, together with objective ones. The questions were asked according to a standard questionnaire. A student of biomedical sciences was well-educated to ask questions, without any possible guiding clues. This descriptive pilot study was conducted from June 2016 to November 2016. In this study, 150 ECG operators including 103 females (68.7%) and 47 males (31.3%) were interviewed. The mean age of them was 30.8±10.5 years. Also, 55(36.7%), 21(14%), 67(44.7%), 6(4%) and 1(0.7%) of them had high school diploma, Associate, Bachelor, Master and PHD degrees, respectively.

Only 47.3% of them plugged off the ECG device when they performed a standard ECG. Plugging off the device during ECG-performance perhaps seems to be a simple and trivial issue; however, more than half of the ECG-operators performed ECG while the device was plugged in, that may lead to some disturbance, including noises and misinterpretation.

On the other hand, 72.7% of them plugged in the ECG device at the end of the usage of the ECG-device; once, they were asked to show speed and voltage buttons, 74.7% and 72% of them made true answers. As objective questions, ECG with changed speed and voltage was presented to them to recognize the speed or voltage errors; only 47.3% and 46% of them recognize the speed and voltage errors, respectively. In this study, 65.3% of the subjects controlled and checked the set-up of the ECG device including speed and voltage before performing ECG and 4% at the beginning of working shift; however, about 30.7% did not check the ECG device in view of speed and voltage set-up. Also, 96.7% and 89.3% of the ECG operators defined correct places of the limb and chest leads, respectively. When they were asked to perform a classic left sided-ECG, 96.7% and 96% of them showed correct performance of installation of limb and chest leads, respectively. When they were asked to perform right sided-ECG, 71.3% showed true performance. The true performance was lower when they were asked to perform posterior sided-ECG, in which, only 49.3% revealed true performance. Once, they were asked to perform Lewis-ECG leads, the number of true answers was dramatically low, in which, only 8.7% expressed the correct performance. When an ECG with noise errors was presented to them, 88% of them could recognize the noise problem in the ECG. As an interesting point, all of them suggested at least one true solution to eliminate or diminish noises in ECG. As our pilot study showed, there were several pitfalls in performance of a standard ECG and some of them should be considered carefully. Although our study was a pilot study with a limited sample population, it was clear that most of the operators performed only routine practices and were not familiar with special issues on elec-

trocardiography. In conclusion, performance of a correct and standard ECG is an inevitable need. It seems that there are numbers of pitfalls in the knowledge of ECG-operators. Careful re-evaluation of educational programs and settling intermittent workshops are warranted.

CONFLICTS OF INTERESTS

There is no conflict of interest.

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