

ECG-based Potassium Measurement is Unaffected by Errors in Blood Potassium Measurement during Hemodialysis

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ABSTRACT

Potassium homeostasis is fundamental to life, and hyper- or hypokalemia are related with possibly dangerous arrhythmias. Patients with end-stage renal sickness have potassium dysregulation and are inclined to hyperkalemia, with pre-dialysis hyperkalemia related with expanded unexpected demise, all-cause mortality and arrhythmia-related hospitalization. This affiliation raises the likelihood that undetected and unmanaged hyperkalemia may add to the abrupt demise occasions, with maybe the most serious hazard happening close to the finish of the long weekend rest experienced by hemodialysis patients.

As of now, the main methods for evaluating serum potassium is through phlebotomy-based research center estimation of blood potassium, which expects travel to a clinical office, is difficult, what's more, requires research facility hardware and prepared staff. In request to gauge potassium levels whenever in a non-intrusive way which can be constrained by the patient's ECG-based potassium appraisals have been presented. These tests may license locally situated

remote potassium appraisal, improving clinical consideration.

We as of late got information from a multicentre associate of patients experiencing haemodialysis while wearing a remote ECG fix as a feature of an investigation to evaluate arrhythmia trouble in dialysis patients. While the ECG fix was most certainly not explicitly structured or enhanced for non-intrusive potassium evaluation, we applied the handling instruments in an exploratory, formative way to analyze blood potassium esteems gotten from the prepared single-lead ECG to the blood potassium test. In a subset of these patient's blood testing exhibited a checked drop in potassium during dialysis followed by an atypical bounce back as dialysis proceeded in complexity to the run of the mill exponential rot expected, though the physiological ECG-inferred potassium test gave anticipated test results. We guessed that the surprising blood test results originated from blood drawing blunders during dialysis, prompting mistaken outcomes, and that the ECG-inferred potassium tests were unaffected and all the

more precisely reflected blood potassium levels. Potassium variations from the norm can cause life threatening arrhythmias. Estimating potassium requires access to blood. We have created strategies estimating potassium noninvasively utilizing the handled, signalaveraged ECG. Four patients in a bigger report, were found to have unforeseen disparities between estimated blood potassium and ECG-inferred assessed potassium esteems. Of 240 patients enlisted at 17 destinations in the Forecast (REVEAL-HD) study, 200 wore a consistently recording single-lead, remote ECG fix. Blood for sciences was gotten once previously, twice during and once after dialysis. Complete blood test and ECG information were accessible for 142 subjects. The general potassium design during dialysis was an exponential rot all through the treatment. Four subjects, whose blood potassium esteems, be that as it may, not ECG-based potassium esteems, strayed from this pattern are the subjects of this analysis. These results are good with blood attracting mistakes which dialyzed blood was acquired from the venous return, as opposed to from the blood vessel tubing. A physiologic, ECG-put together test that gauge's potassium with respect to the premise of the convergence of potassium in the blood encompassing the heart is liberated from nearby distortions and may be a valuable potassium observing apparatus in dialysis patients. The single lead ECG was set in a fixed situation on the foremost chest for each of the five days, which was marked with a permanent marker. The fix position was chosen at the hour of starting situation by inspecting three standard precordial areas and choosing the site with an ideal uniphasic twave. This ECG was utilized to evaluate potassium, utilizing methods that we have portrayed beforehand. Utilizing the ECG information from the principal dialysis meeting and the procured blood potassium test results, an individualized scientific model portraying the connection between blood potassium and each patient's ECG as gained by the fix was consequently made in a Matlab structure. This model was utilized to decide blood potassium levels from the ECG information on ensuing dialysis days.

Keywords: Electrocardiography; Potassium; Kidney failure chronic; Dialysis