

Concept of the EQA program CASE STUDIES in Clinical Laboratory Science

Based on the feedback for the ESfEQA program CLINICAL CASE STUDIES we offer another EQA program CASE STUDIES in Clinical Laboratory Science. Whereas medical doctors are the target group for the program CLINICAL CASE STUDIES this new program CASE STUDIES in Clinical Laboratory Science is intended for technical personnel in medical laboratories. It aims to support and to strengthen the skills of the staff for (pre)analytical questions.

Each survey of the CASE STUDIES in Clinical Laboratory Science program provides a case description with analytical data for Clinical Chemistry parameters, Hematology, Coagulation and related areas.

The participants of the survey will be asked for their interpretation, explanation and corrective actions (if applicable) for the described case.

Possible answers will be provided in drop-down lists. The participants are requested to select one or several answers that seem to be appropriate.

ESfEQA is a company based in Heidelberg/ Germany and accredited according to DIN EN ISO/IEC 17043. ESfEQA offers more than 100 external quality control programmes in the fields of biochemistry, haematology, immunology, microbiology and molecular diagnostics.

For more information, please visit our website www.esfeqa.eu.



*For new participants:
Free participation in
the first 2 case studies*

CASE STUDIES IN CLINICAL LABORATORY SCIENCE

EDUCATIONAL PROGRAM FOR TECHNICIANS

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CASE STUDIES in Clinical Laboratory Science

Case information

You validate sodium, potassium and calcium results obtained from a lithium heparin plasma sample. The values obtained in a previous analysis two days before are listed next to it.

Analyte	Day 2	Day 0	Reference range
Potassium (mmol/L)	23,4	5,8	3,5-5,0
Sodium (mmol/L)	133	136	135-145
Ionized Calcium (mmol/L)	<0,10	1,10	1,15-1,35

Which observations apply?

- A. Potassium increase incompatible with life
- B. Increase in Potassium can be explained biologically
- C. Drop in calcium cannot be explained by physiological fluctuations
- D. Life-threatening decrease in sodium

Expected answers: A and C

What are the possible explanations?

- A. Values are plausible and can be released
- B. EDTA contamination of the sample from day 2
- C. Sodium citrate contamination of the sample from day 2
- D. Blood collection from indwelling venous catheter after previous potassium chloride infusion
- E. Interference with the measurement due to an air bubble

Expected answer: B

Comments

The extremely high potassium as well as the non-measurable ionized calcium from day 2 are incompatible with life. The strong changes to the previous values cannot be explained physiologically either. Therefore, the correctness of the results from day 2 must be doubted. Even when a sample is obtained from an indwelling venous catheter after a previous potassium chloride infusion, such high potassium values do not occur.

The assessment of the results in connection with the preliminary values suggests the suspicion of a pre-analytical problem. Chelating agents such as citrate or EDTA, which are frequently used as anticoagulants in blood collection vessels, bind calcium and lead to falsely low results. Potassium EDTA in particular has a very high affinity for divalent ions such as calcium (but also magnesium), which means that calcium cannot be measured using standard laboratory methods. The potassium also contained in potassium EDTA tubes artificially increases the amount of potassium contained in the sample. The constellation shown here can result either from contamination due to non-compliance with

the sampling sequence or from incorrect use of an EDTA tube. Sometimes insufficiently filled tubes are topped up by the recipient with the contents of other tubes without taking the influence of additives into account. The slightly lower sodium concentration in combination with the extremely high potassium result excludes sodium citrate contamination. Furthermore, citrate does not usually lead to such a strong reduction in calcium. An air bubble as an explanation for the conspicuous results on day 2 is extremely unlikely, as this error would probably cause falsely low values for all three analytes.

Scientific advisors

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Registration

Please contact your local distributor or ESfEQA directly (info@esfeqa.eu) for information on how to get enrolled in the ESfEQA CASE STUDIES in Clinical Laboratory Science.

The ESfEQA program CASE STUDIES in Clinical Laboratory Science is offered on a bi-monthly basis. Participants can start at any time of the year.

ESfEQA offers free participation in the first two case studies to new participants interested in the program.