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INSTAND

Report on Online Training
Group 902
Urine Sediment

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Edited by:
INSTAND
Society for Promoting
Quality Assurance
in Medical Laboratories e.V.

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Explanation for the evaluation

In addition to the documents sent to you by mail, you will receive further information on the training here.

Certificate of participation

All training segments are listed on the certificate of participation.

Individual printout of results

Participants could view the solutions immediately after answering each question and could download the entire training with all tasks and solutions as a PDF file after submitting the training.

General overview of results

Tabular summary:

Analysis Urine Sediment (N=55)	
Passing rate [%]	94.5
Mean of percentage points [%]	83.4
Range of percentage points [%]	50.5-100

Diagnosis Urine Sediment (N=48)	
Passing rate [%]	43.8
Mean of percentage points [%]	49.0
Range of percentage points [%]	4.0-84.0

Training materials

For this training, images and questions were made available online and as a PDF document. After each task, the individual result and an expert commentary on the answers could be seen.

Solutions and assessment scheme

The tasks were compiled in cooperation with the above-mentioned expert (Dr. Falbo) and the solutions were approved by her.

The tasks are multiple-choice, single-choice and matching tasks. For multiple choice and matching tasks, the participant receives 1 point if all correct answers are selected. If not all answers are correct, the points are calculated by dividing the number of correct answers by the number of possible answers.

Correctly identified wrong answers are counted as correct answers.

At least 60 % of all achievable points are required to receive a certificate of successful participation in the analysis or diagnosis of the cases.

Comment

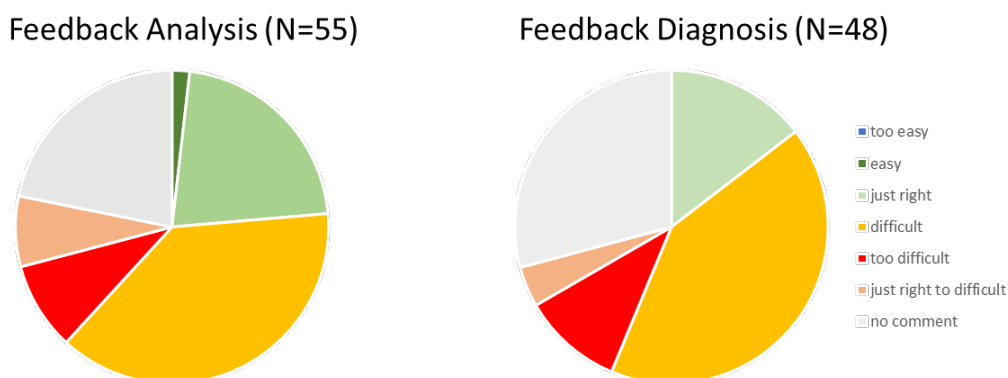
Dear participants,

The current online training course 'Urine Sediment' was again addressed to technicians and laboratory managers.

Thus, the 'Online Training Urine Sediment' is divided into two themes, the analytical part and the diagnostic part. The participants can decide for themselves whether they want to complete only one or both parts. The 'Analysis' and the 'Diagnosis' are evaluated separately.

In this training, the analytical part of the training was completed by 55 participants. 48 participants also answered the diagnostic questions.

About 78 % of the participants gave feedback on the difficulty of the training. Almost 22 % of the feedback for the analytical part of the training was "just right", 38 % "difficult" and 9 % "too difficult". For the diagnostic part of the training, 79 % of participants rated the level of difficulty: about 15 % found the questions "just right", 42 % "difficult" and 10 % "too difficult". The pass rate in the analytical part (94.5 %) is pleasing, in the diagnostic part (43.8 %) lower than in the last training.



In the analytical part, the average percentage points achieved for the individual questions ranged from 64.4 % to 93.0 %.

In urine sediment 3, uniform blue arrows pointed to supposedly different structures. This was not a technical or display error. All arrows point to calcium oxalate crystals (dihydrate), which can occur in

many different sizes and are therefore often confused with other particles. Very small crystals can be mistaken for bacteria, plant pollen or talcum powder particles. If questionable objects are suspected to be erythrocytes, the clinical-chemical parameters, which are always given for the individual cases, are helpful: In this case, no hematuria or other abnormalities were observed in the urine stick analysis.

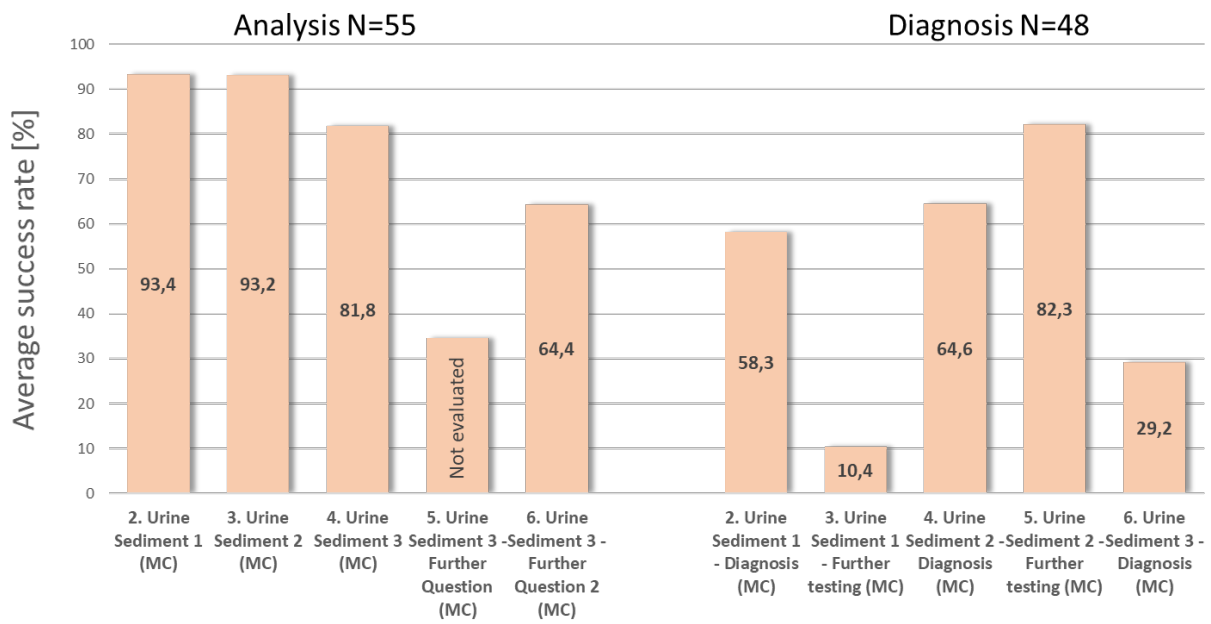
Many participants stated in the following question (Card 5: Urine sediment 3 - further question) that the crystals could also be mistaken for yeast cells. However, since no hyphae or pseudohyphae as well as conspicuous strangulation on elliptical objects can be recognized, this is unlikely. However, since small yeast spores without constrictions and pseudohyphae can in principle be confused with the crystals, this was considered in the evaluation and this question was removed from the evaluation. There is no disadvantage for any of the participants due to the fact that this question was not scored.

In the diagnostic part of the training, the average percentage points achieved for the individual questions ranged from 10.4 % to 82.3 %.

When answering the question "Card 3: Urine sediment 1 - further procedure" of the diagnostic part, some participants stated that B and D (microscopy with polarised light and suprapubic aspiration) and C and D (ultrasound of the kidneys and suprapubic aspiration) are the further steps in finding the diagnosis. With the help of powerful infrared spectroscopy, a lot of information about the crystals such as the compound, crystal structure and isomorphism become accessible. Microscopy with polarised light is also a tool for identifying crystals. Birefringent materials such as crystals have two optical axes and refract planar polarised light into two beams that move in perpendicular directions. This property can be used to characterise many crystals. Ultrasound examination of the kidneys does not help to identify the type of crystals. Suprapubic aspiration, an invasive procedure, also does not help identify the crystals.

In the case of the Urine Sediment 3 - Diagnosis (MC) question, many participants stated that calcium oxalate crystals (in the dihydrate form) occur in the urine during ethylene glycol poisoning. Only the monohydrate calcium oxalate crystals are responsible for kidney damage (Seo, J.W., et al., *Acute oxalate nephropathy caused by ethylene glycol poisoning*. *Kidney Research and Clinical Practice*, 2012. 31(4): p. 249-252.). The hypothesis is that the ethylene glycol metabolite oxalate accumulates in the proximal renal tubule, so oxalate crystals can form. Calcium oxalate monohydrate crystals are then transported intracellularly by the kidney cells. It is discussed that renal toxicity results from the inhibition of mitochondrial respiratory function in proximal tubule cells. This can lead to death of the renal cells (Scalley RD, Ferguson DR, Piccaro JC, Smart ML, Archie TE. *Treatment of ethylene glycol poisoning*. *Am Fam Physician*. 2002 Sep 1;66(5):807-12).

Below you can read the average success rates of the individual subtasks.



We would like to thank all the participants who sent us comments. Your feedback is very valuable for us.

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Mailand

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