The pre-analytical phase, an important step for potential error: a study of 300 requisition and report cards of samples received for urine culture from general practice in Hedmark and Oppland fylker, Norway

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Background

Within the walls of the microbiology laboratory every effort is made to minimize error during the analytical process, i.e. the preparation and analysis of samples. The influence, however, of the laboratory on the pre-analytical phase – i.e. the time before the sample arrives at the laboratory – is limited.

Investigations suggest that up to 70% of all mistakes made in laboratory diagnostics can be attributed to mistakes made in the pre-analytical phase such as indication for test, patient preparation, sample collection and transportation. It must be emphasized that no analytical process can make up for an erroneously ordered, prepared and collected sample taken for the wrong reasons.

The microbiology laboratory in Lillehammer, Norway, which currently processes approximately 450,000 samples per annum, is part of a large Health Trust, Sykehuset Innlandet, and covers a catchment population of approximately 400,000 inhabitants in a vast mountainous area of 52,000 km2. Storage, transportation and direct communication pose particular challenges in such a setting.

We have in our study focused on particular steps of the pre-analytical phase, i.e. clinical question posed, appropriateness of clinical question, quality of sample collection and transportation time, by auditing 300 urine samples sent for culture during one week in 2015.

Material and methods

During one week in February of 2015, 300 urine samples received for urine culture, from general practitioners in Hedmark and Oppland fylker in Southeast Norway were audited using the requisition records, reporting cards, and laboratory notes in the laboratory information system, CGM Analytix™. Information was extracted from the records concerning:

- clinical indications for urine culture based on patient symptoms/signs
- quality of sample collection (container, volume, transport damage and microbiologically)
- transportation time

Results

In total 300 requisition and report cards were checked together with any comments made in the laboratory information system.

Table 1: Sample Dates for 300 urines

Present	Absent
289 (96.3 %)	11 (3.7 %)

Table 2: Transport Times for 289 urines

Mean	Ranges
1.1 days	1-5 days

Table 3: Quality of sample and sample collection

Parameter	Appropriate	Inappropriate
Container	291 (97 %)	9 (3 %)
Volume	295 (98.3 %)	5 (1.7 %)
Technique	270 (90 %)	30 (10 %)

Requests with a clinical question and information on patient signs and symptoms appropriate for urine culture were present in 176/300 requests (59 %). Requests with inappropriate clinical question with insufficient data in relation to urine culture were found in 107/300 (36 %).

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Conclusion

The transportation time was satisfactory and fully compatible with our sample recommendations for urine culture. In accord with previous reports our results demonstrating:

- 59 % of requests had sufficient data,
- 36 % insufficient information
- 10 % had suboptimal sample quality

make improvement of the pre-analytical phase a relevant issue in our setting too.

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