OPEN ACCESS

ISSN: 2835-6764

AJSER:1000107
e Silva HdQ, et al. American J Sci Edu Re: AJSER-107

Research Article

American Journal of Science Education Research

The Importance of Quality Control in Uroculture in Clinical Analysis Laboratories

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Citation: e Silva HdQ, Lopes CCC, Lopes EB, Lopes MEC, Lopes LC, et al. (2023) The Importance of Quality Control in Uroculture in Clinical Analysis Laboratories. American J Sci Edu Re: AJSER-107.

Received: Jan 27, 2023; **Accepted:** Feb 06, 2023; **Published:** Mar 13, 2023

Abstract

Urine culture is known as the gold standard for diagnosing urinary tract infections, a condition that affects millions of people each year. In most laboratory practices there is a need for human action, thus being prone to errors, a result of the lack of standardization or performance of quality processes, being able to issue reports despite the clinical condition of the patient. Taking this information into account, this work aimed to present the importance of quality control in urine culture in clinical analysis laboratories, through a bibliographical, exploratory, descriptive review. The correct execution of quality control processes is capable of gradually reducing the incidence of errors arising from human practice, therefore, the importance of incorporating quality control into the routine of clinical analysis laboratories is noted.

Keywords:

Clinical Laboratory. Quality control. Urine culture.

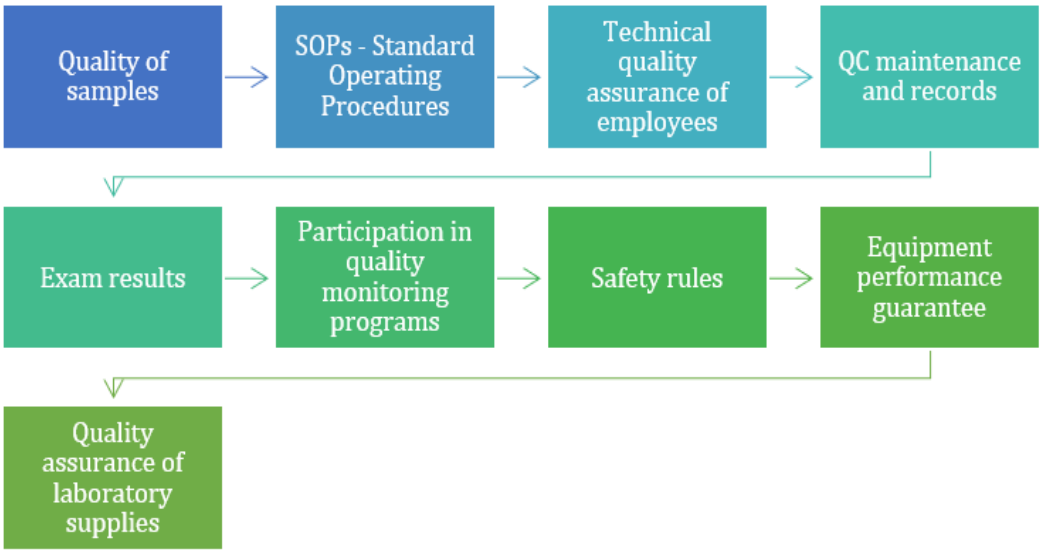
Introduction

Urinalysis has the advantage of easy access to biological material and is considered non-invasive. This exam also helps in the diagnosis of several diseases, as the kidneys are mainly responsible for the excretion of a range of substances resulting from cellular metabolism. The variety of information that the urine test provides justifies why it is the test with the highest rates of requests in a clinical analysis laboratory [1].

Known as the reference method, microscopy is capable of detecting constant elements in urine. This exam is important in monitoring levels and pathological diagnoses in cases of patients with suspected kidney diseases and urinary tract infections [1].

The *Clinical Laboratory Standard Institute* (CLSI/NCCLS) organized a quality system for clinical tests, developed for clinical analysis laboratories, composed of requirements made available by the bodies: *College of American Pathologists* (CAP), *Clinical Laboratory Improvement Amendments* of 1988 (CLIA) and by JCAHO - *Joint Commission on Accreditation of Healthcare Organizations* [2,3,4].

The quality program consists of nine basic elements, in the following order:



Flowchart 1: Basic elements that make up the quality program.

Author: OPLUSTIL et al., (2004) [5]; adapted (2021).

The Brazilian Society of Clinical Pathology/Laboratory Medicine (SBPC/ML) and the Brazilian Society of Clinical Analysis (SBAC) standardize quality assurance for clinical analysis laboratories, through DICQ (Quality Control) programs and laboratory accreditation, having as main QC tools the proficiency tests, alternative control and interlaboratory control. However, analytical processes demand control measures for full monitoring and excellent execution.

Thus, this brief bibliographic review aims to analyze the importance of quality control in urine culture in clinical analysis laboratories.

Methodology

This expanded summary was developed through a bibliographical review of the descriptive exploratory type, regarding the theme "The Importance of Quality Control in Urine Culture in Clinical Analysis Laboratories". Data collection was carried out from October 28 to November 2, 2021, using Google Scholar, MedLine, Scientific Electronic Library Online (SCIELO) and *National Library of Medicine* (PUBMED) platforms. There were 17 papers, including articles, theses and monographs, published between the years 2000 and 2021. The main keywords raised were: clinical analysis laboratory, quality control and uroculture. The cardinal criteria used for the selection and inclusion of articles were: articles published in Portuguese and English within the research deadline. After selecting the articles according to the previously defined inclusion criteria, the following steps were followed: exploratory reading, proposing to extract the essentials of each work/publication and, in short, the realization of this expanded summary, encompassing the main information on the subject in question.

Results and Discussions

When it comes to laboratory quality control, urine testing faces several challenges. At a time when traceability and dubiousness are well described in biochemistry and hematology, when it comes to urinalysis, these terms are questionable. To obtain the highest level of acquiescence among observers, cytopathological studies for morphological analyzes are being used (EUROPEAN URINALYSIS GROUP, 2000).

In the direction of an accurate diagnosis, it is essential to insert a well-designed process control system, to ensure efficient health services, so that the characteristics and readings of each component become very distinct and are capable of being reproduced, regardless of of the observer. achieving quality, succeeding there is a decrease in waste and costs [1,6].

In the pre-analytical phase, variable factors involved in clinical laboratory errors are observed. Such phase is considered the most vulnerable to errors, in general, in processes which are carried out outside the manually executed laboratories. The lack of qualification and training available to professionals covered in the pre-analytical processes is still the main factor responsible for the frequency of errors in laboratories. In health, as in any practice, it is actually impossible to completely eliminate errors, but the possibility of reducing them [7].

In a study carried out by Mendonça et al. (2015) [8] it was highlighted that 65% of urine sample collections for uroculture were due to improper storage or collection of the clinical specimen, in the pre-analytical phase. The strengthening of communication between the clinician and the patient emerges as a significant alternative, where clarifications about the performance of the collection are provided in a clear way to the patient, generating a decrease in inadequacies regarding the collection, transport and storage of the sample.

As provided in the ISO, in different sectors, quality is the fit for use and compliance with requirements. All stages of a practice are important; being developed with quality, the final result will be satisfactory and reliable.

All clinical analysis laboratories must have the objective of quality control to ensure that preventive attitudes are used in practice to proscribe or reduce the risk indicators that may arise during the process of carrying out the laboratory examination.

Dias et al. (2018) [9], noted in their study that after standardizing the requirements for quality processes in urocultures, and for the accreditation process in a clinical analysis laboratory, positive results were obtained, as there was a significant increase in on the quality of the exams. And conversely, there was a 49% reduction in urine culture contamination and a 32% reduction in the delay in delivering results. This demonstrates that the more one invests in qualifications, the more the team becomes competent to arrive at accurate exam results.

Martins and Dos Santos (2019) [10] say that analytical errors in microbiology, in the case of urine cultures, can harm the patient's therapy and emphasize the importance of quality management in microbiology laboratories, at all levels, attributing this due to the the role of the laboratory in the management of infectious, emerging and multidrug-resistant pathogens.

It is clear that the implementation of quality control, that is, a quality management system, generates greater security in the execution and release of results. Compliance with resolutions and regulations not only guarantees a good performance in the execution of the analysis, but also ensures that the laboratory is within the requirements of sanitary surveillance, expanding the possibilities of participation in bids, accreditation in health plans and provision of services to companies.

Final Considerations

It was observed that it will be possible to guarantee quality, from the moment that the entire exam process can be traced, from the collection, to the issuance of the report, having as an important point the standardization of the reported results. We should also consider the importance of employee training regarding patient orientation, about the exam to be performed and the collection, and to emphasize safety standards.

Finally, every process must guarantee quality, starting with internal control, consistently following the techniques standardized by regulations in order to correctly evaluate a result. The main purpose of quality control and the process is to provide the patient with a correct and safe diagnosis.

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