

## An Addition of Boric Acid To Test The Number of Urine Cylinders

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**Abstract**—Urinalisa is a screening test to determine kidney disorders, urinary tract or metabolic disorders. Urinalysis must be done when the sample is still fresh. Delays in examinations will have a major effect on the stability of the test and the validity of the results of the examination. In the stages of urinalysis or other laboratory examinations, the biggest error lies in the pre-analytic stage, among others, is the handling of samples prior to examination. The existence of this case requires us to deal with the problem. The aim of this study is to determine the effect of urine treatment with additional additives on the number of cylinders. This study is an experimental experiment with an interpretive posttest control group conducted in May 2018, at the Clinical Laboratory Laboratory Dr. Sardjito. A total of 30 urine samples were divided into two groups, namely the control group and the experimental group. The control group only contained urine without the addition of boric acid, while the experimental group was given treatment in the form of addition of boric acid, the residence was carried out at 3 hours and 6 hours. Amount of cylinder urine was examined by Urine Analyzer Sysmex UF-500i. The results showed that the average number of slides decreased in delay for 3 and 6 hours in the chambers, both with boric acid addition and addition of boric acid. With the difference in 3 hours as much as 0.2 cells /  $\mu\text{L}$  higher the experiment and at 6 hours 0.3 cells /  $\mu\text{L}$  higher the control. The conclusions of this study are the effect of a number of urine cylinders which are resided within 3 hours and 6 hours at the temperature of the brain with the addition of boric acid.

**Keyword:** Cylinders, boric acid, delay, urine

### 1. INTRODUCTION

Laboratory test is the main step to be used in the diagnosis of a disease, one of which is the examination of urine urinalysis. Urinalysis is often done because the examination material is easy to obtain and the examination technique is not difficult. Urinalysis that is done in each patient is to show the presence of substances under normal conditions not in the urine<sup>1</sup>. Urine is a residual fluid that is excreted by the kidneys which will then be excreted from the body through the urinary system. Urine samples are easily obtained and in certain clinical situations can provide very useful information. Indications for urine tests are for filters on health tests, pathological conditions and before surgery, determining urinary tract infections, leukocytes and bacteria<sup>2</sup>. Urine is a waste product, but urine contains a lot of important information. Standardized procedures for collection, sample delivery, sample preparation and analysis form the basis of effective diagnostic strategies for urinalysis. Advanced technology has been developed to support the accuracy and quality of urinalysis results. Pre-analytic requirements are very important to be considered by laboratory technicians who handle urine specimens directly<sup>3</sup>.

Besides, delay in sending urine samples and delay in examinations are still common in hospitals. Delays due to waiting for a number of samples that must be collected to be examined together<sup>4</sup>. The existence of these problems are required the proper handling of samples so that the samples are not damaged, which called adding boric acid. It is expected that the addition of boric acid can be an alternative for preserving samples.

## 2. MATERIALS AND METHOD

This research is a pre-experimental study with a *pretest-posttest* control group research design. The study used 30 urine samples taken from out patients with inclusion requirements for the number of urine cylinders > 1.2 cells /  $\mu$ L. Urine samples were divided into two groups, the control group without the addition of boric acid and the experimental group which has the addition of boric acid. The two groups were left at room temperature and examined the number of urine cylinders after 3 hours and 6 hours of residence using the Urine Sediment Analyzer Sysmex UF-500i. The data obtained were analyzed descriptively through averaging calculations, standard deviations and variation numbers in the form of tables and charts

	Direct	delay			
		3 hours		6 hours	
		without	with boric acid	without	with boric acid
<b>cylinder Urine</b>	8,3	7,0	7,2	6,6	6,9
<b>DS</b>	10,1	8,7	9,0	8,2	8,0
<b>CV</b>	122	124,2	124,8	119,4	121,3

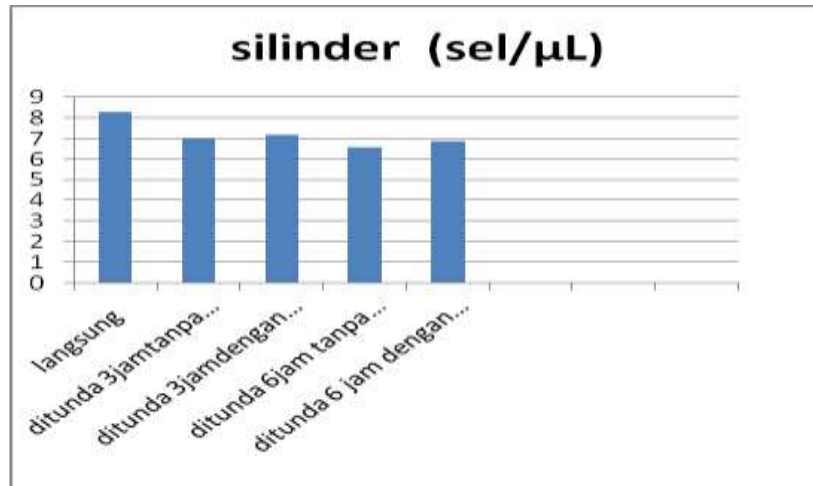
## 3. RESULTS AND DISCUSSION

Table 1. The data obtained in this study were the results of examining the number of urine cylinders and gave treatment in the form of addition of boric acid and dosing at 3 hours and 6 hours as shown in the table.

	Direct	delay			
		3 hours		6 hours	
		without	with boric acid	without	with boric acid
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Based on the table, it can be concluded that the number of urine cylinders that are directly examined has an average of 8.3 cells /  $\mu$ L. The average number of cylinders after settling for 3 hours without addition of boric acid was 7.0 cells /  $\mu$ L and with the addition of boric acid of 7.2 cells /  $\mu$ L. Besides, the average number of urine cylinders after settling for 6 hours without the addition of boric acid of 6.6 cells /  $\mu$ L and with the addition of boric acid gave an average yield of 6.9 cells /  $\mu$ L. Descriptive results are shown in figure :

Figure 1. presents the average number of cylinders in urine immediately examined and after planting at room temperature with and without the addition of boric acid.



The average number of urine cylinders after 3 hours of residence with the addition of boric acid is higher than without the addition of boric acid, as well as in 6-hour settling the number of cylinders more with the addition of borate..

The results of laboratory tests are very important, since all of the diagnoses are the results of laboratory test which one of them is urinalysis. Pre-analytic problems are caused by delays in examinations due to delays in sample delivery and some other technical issues which make the result is inaccuracies.

This study was conducted to determine whether there is an effect of urinating on the addition of boric acid as a preservative to the number of cylinders in the urine. Cylinders in urine are chosen as examination parameters because they are often used as a reference for the patient's condition on laboratory urinalysis. The use of automated methods is more advantageous because it saves time and laboratory results are quickly accepted [5].

In this study, using boric acid as a urine preservative. The use of boric acid of 0.18 grams in 10 mL of urine according to boric acid is bacteriostatic at concentrations of 18g / L [4]. This bacteriostatic property inhibits bacterial activity in the urine so it does not decompose urea into ammonia and carbon dioxide which can lyse the silinder elements in urine. Boric acid as a preservative will retain the cylinder in the urine so that the amount will not decrease. Addition of boric acid with a delay of inspection for 3 hours will reduce the number of cylinders by 11 (difference) divided by the number of cylinders by direct inspection (83) multiplied by 100% = 13%. Addition of boric acid with a delay of inspection for 6 hours will also reduce the number of cylinders by 14 (difference) divided by the number of cylinders by direct inspection (83) multiplied by 100% = 17%.

The results of the examination showed that there was a decrease in the number of cylinders in the urine at the residence for 3 hours or at 6 hours at room temperature, both in the treatment of addition of boric acid and without the addition of boric acid. Checking the cylinder using the

## CONCLUSION

In conclusion, the addition of boric acid and delay of 3 hours caused the cylinder decrease 13%. On the other hand, the addition of boric acid and delay of 6 hours made the cylinder decrease 17%, thus, the delay with the addition of boric acid reduced the percentage of damage to the cylinder .

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