

Assessing Reasons for Delay of Renal Function Test in OPD
Patients of Abeer Family Medical Center, Kozhikode

By

Aathira Ravindran

*Dissertation submitted in partial fulfillment of the requirements of the degree
MBA Hospital and Health Management*

Academic year, 2017-2019



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TO WHOMSOEVER MAY CONCERN

This is to certify that Dr. Aathira Ravindran, student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Abeer Family Medical Center, Kozhikode from 6th February 2019 to 6th May 2019.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements.

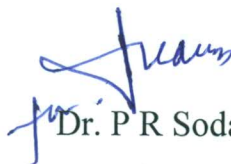
I wish her all success in all her future endeavours.



Col.(Dr.) Ashok Kaushik

Dean, Academics and Student Affairs

The IIHMR University, Jaipur



Dr. P R Sodani

Pro- President

The IIHMR University, Jaipur

Abeer Family Medical Center



TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Aathira Ravindran** student of IIHMR University, Jaipur has successfully completed internship and project from **06.02.2019 to 06.05.2019**.

We found her sincere, hardworking, technically sound and result oriented. We take this opportunity to wish her all the best for her future endeavors.

For Abeer Family Medical Center

Teenu Babu
Executive-HR



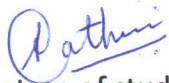
CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**Assessing Reasons for Delay of Renal Function Test in OPD Patients**" and submitted by **Dr. Aathira Ravindran** Enrollment No.IIHMR-U/01/2017-19/0521 under the supervision of **Dr. P.R.Sodani** for award of MBA in Hospital and Health/Pharmaceutical/Rural Management in Health and Hospitals of the University carried out during the period from **6th February, 2019 to 6th May, 2019** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.


Signature

THE IIHMR UNIVERSITY, JAIPUR
CERTIFICATE BY SCHOLAR

This is to certify all ethical issues have been considered while collecting data for my dissertation titled "Assessing reasons of delays for Renal Function Test in OPD patients" of Abeer Family Medical Centre, Kozhikode, Kerala (February 2019).



Signature of student

ABSTRACT

Title: Assessing Reasons for Delay of Renal Function Test in OPD Patients of Abeer Family Medical Center, Kozhikode

Author: Dr. Aathira Ravindran

Introduction: A laboratory is a place where information about the health of a patient is obtained with the help of tests to aid in the diagnosis, treatment and prevention of disease. Laboratory services helps in prescribing the dose of medicines to be given for treatment, to know the nature of pathogens causing the disease, to know the electrolytes level in blood, to understand the antibiotics sensitive and resistant to the bacteria and also to identify the drugs which the patient is allergic to, to avoid adverse drug reactions .

It is a well designed and organized department using modern equipments and technology. All the major divisions of the laboratory diagnostic services is available and a team of highly competent and skilled doctors and technicians deliver quality credible results in the minimum possible time.

RESEARCH OBJECTIVES

- To find the number of delays from the standard turnaround time of 2 hours for Renal Function Test
- To provide suggestions to reduce the delay

METHODOLOGY

Area of study: The study was conducted on OPD patients in Abeer Family Medical Center, Kozhikode.

Design: Cross-sectional study

Study population: Inclusion criteria: All outpatients with renal impairments were included in the study .

Duration of study: 3 months

Sample size: All the samples collected from 1st March to 15th April, 2019 are included for each parameter of Renal Function Test .

Sampling technique: The data was collected on the basis of convenience sampling.

Data} collection procedure: Primary data was collected from Hospital Information System .

RESULT AND CONCLUSION: There was a total delay in 13.2% samples. Most of the delays were between 0-30 minutes beyond the standard turnaround time of 2 hours for each marker of Renal Function Test. Majority of the samples reached the laboratory 30-40 minutes after collection by nurse.

KEY WORDS – Renal Function Test, Sodium, Potassium, Urea, Creatinine, Chloride, Bicarbonate, delay, turnaround time

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to **Dr. Jemshith Ahmed**, Vice President – Strategic Planning, Abeer Medical Group and **Mr. Jayaprakash M.C.**, Chief Human Resource Officer, Abeer Medical Group for granting me the opportunity for training .

I sincerely thank **Mr. Koshy Ancheril**, Senior Human Resource Manager, Abeer Medical Group, Kozhikode and **Major (Dr.) Dinesh**, Operations Head, Abeer Medical Group for his guidance and encouragement in carrying out this project .

I also wish to express my gratitude to **Ms. Teenu Babu**, Senior Executive Human Resource, Abeer Family Medical Center, Kozhikode and **Mrs. Bhuvana Dinesh**, Senior Lab Technician, Abeer Family Medical Center, Kozhikode who helped in completion of the project .

I am also thankful to my guide, **Dr. P.R.Sodani**, Professor, Pro President and Dean- Training, IIHMR University, Jaipur for his constant help and suggestions during my training .

Last but not the least, I would like to thank the entire **Operations Team** of Abeer Family Medical Center, Kozhikode, for all the guidance and help they provided for the completion of this project .

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ABBREVIATIONS

- KSA : Kingdom of Saudi Arabia
- UAE : United Arab Emirates
- ICU : Intensive Care Unit
- NICU : Neonatal Intensive Care Unit
- ACLS : Advanced Cardiac Life Support
- HAAD : Health Authority – Abu Dhabi
- JCI : Joint Commission International
- OPD : Outpatient Department
- IT : Information Technology
- HR : Human Resource
- HIV : Human Immunodeficiency Virus
- HCV : Hepatitis C Virus
- CRP : C Reactive Protein
- ASO : Antistreptolysin O
- RFT : Renal Function Test

INTRODUCTION

PROJECT REPORT

Assessing Reasons for Delay of Renal Function Test in OPD Patients of Abeer Family Medical Center, Kozhikode

A laboratory is a place where information about the health of a patient is obtained with the help of tests to aid in the diagnosis, treatment and prevention of disease. Laboratory services help in prescribing the dose of medicines to be given for treatment, to know the nature of pathogens causing the disease, to know the electrolytes level in blood, to understand the antibiotics sensitive and resistant to the bacteria and also to identify the drugs which the patient is allergic to, to avoid adverse drug reactions. The laboratory service also contributes in research and development.

Medical treatment have nowadays become highly dependent on diagnostic services for providing accurate inputs. More than 75% of medical treatment depends on accurate diagnostic results.(1)

Introduction

The laboratory services available are commensurate to the clinical services offered in the organization. It is a well designed and organized department using modern equipments and technology. All the major divisions of the laboratory diagnostic services is available and a team of highly competent and skilled doctors and technicians deliver quality credible results in the minimum possible time .

Renal Function Test

- It is a test to assess the functional capacity of kidneys
- Premature detection of kidney impairment.
- To assess the severity and progress of impairment.
- Monitor response to treatment.(2)

The lab at AFMC, Kozhikode receives one third of its sample for Renal Function Test. RFT occupies the largest proportion of tests done in the lab. The parameters of this test are sodium ions, potassium ions, bicarbonate ions, chloride ions, urea and creatinine which are substances in blood that are normally excreted by kidney .

SCOPE OF SERVICES

The services include the following section of the department:

- Hematology
- Histopathology
- Biochemistry
- Immunochemistry
- Serology
- Microbiology
- Clinical pathology
- Cytology

Equipments in laboratory:

- SysMex BX3010 – Biochemistry (fully automated)
- Minividas – Immunology
- Mispa I2 – CRP, ASO, HbA1C
- Accurex semi analyser – Biochemistry
- Epsilon – electrolyte machine
- Mindray BC 5000 – Hematology
- Centrifuge machine

Working hours

7 am to 9 pm

Staffing

- Incharge
- 1 lab attender
- 1 senior lab technician
- 3 lab technicians
- 1 trainee

Shifts

7 am to 4 pm

8 am to 5 pm

9 am to 6 pm

12 pm to 9 pm

Process flow

After doctor's order the samples are collected by nurse in their respective vacutainer according to the tests ordered. The samples are brought from the nursing station by the GDA to the lab



The sample are received at the lab and the receiving time is noted



The samples that require centrifugation are centrifuged for 15-20 minutes



The samples loaded in the respective machines according for the test ordered by the doctor



The results are received by the doctor on his system through the software mediaware



The patients are given a printed copy of the result.

LITERATURE REVIEW

Delay in sample separation affects the creatinine measurement using the Roche kinetic Jaffe reaction, and can result in the misclassification of CKD staging. Laboratories using the kinetic Jaffe method should not report creatinine results where there has been a delay in separation. This advice should also be reflected in practice guidelines .(3)

Multiple blood samples were taken at a single time-point from five individuals and subject to varying time delays prior to centrifugation, after which serum was separated and analyzed for creatinine by five different methods. The effect of time delay on eGFR was further investigated by measuring creatinine on duplicate patient samples arriving in the laboratory after immediate and delayed centrifugation .

A significant increase in creatinine was seen by 24 h using kinetic Jaffe methods ($P<0.025$). Over a period of 31 h creatinine concentration was stable using enzymatic creatinine assays. Using duplicate patient samples, four of 21 patients where specimens were delayed in the laboratory by more than 10 h showed a misclassification of CKD .

Delays in sample receipt can lead to significant increases in measured creatinine and misclassification of CKD. Enzymatic creatinine assays are reliable with respect to delayed sample receipt over the time course studied .(4)

PROBLEM STATEMENT

There is usually a delay in the laboratory reports of patients in a hospital. This results in delay of procedures to be carried out and the treatment to be given to the patient. It causes inconvenience and dissatisfaction among the patients and increases overcrowding and length of stay in hospital.

RESEARCH QUESTION

- How many tests are delayed from the standard turnaround time of 2 hours for Renal Function Test of OPD patients?

RESEARCH OBJECTIVES

- To find the number of delays from the standard turnaround time of 2 hours for Renal Function Test
- To provide suggestions to reduce the delay

METHODOLOGY

Area of study

The study was conducted on OPD patients in Abeer Family Medical Center, Kozhikode.

Design

Cross sectional study

Study population

Inclusion criteria: All outpatients with renal impairments were included in the study .

Duration of study

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Sample size

All the samples collected from 1st March to 15th April, 2019 are included for each parameter of Renal Function Test .

Sampling technique

The data is collected on the basis of convenience sampling.

Data collection procedure

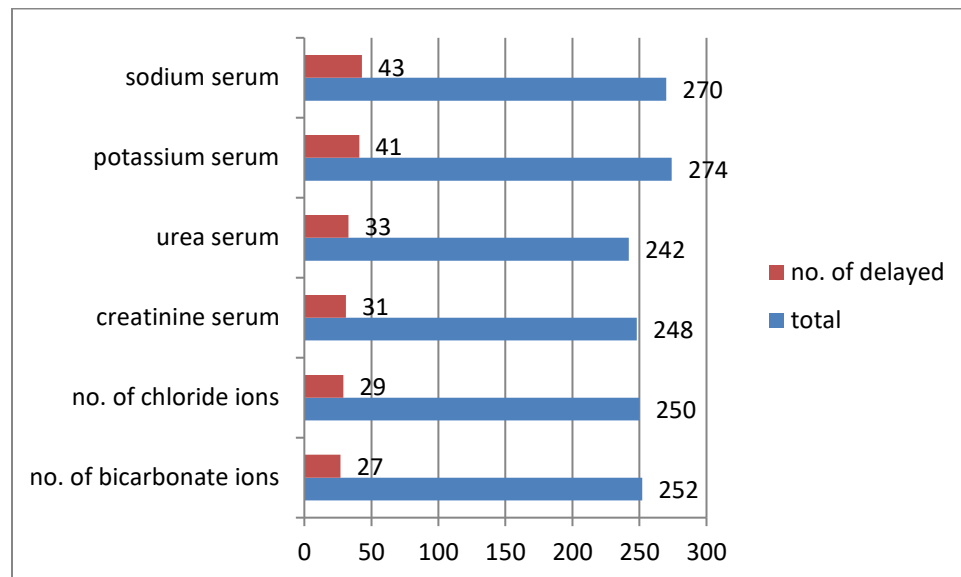
Primary data was collected from Hospital Information System .

DATA ANALYSIS

Data is analyzed with the help of Microsoft Excel and is presented graphically .

Graph 1: Total number of delays in the components 'of Renal Function Test from sample requisition to test verification .

From 1st March to 15th April, 2019



Interpretation

Percentage delay per parameter

Sodium: 15.9%

Potassium: 15%

Urea: 13.6%

Creatinine: 12.5%

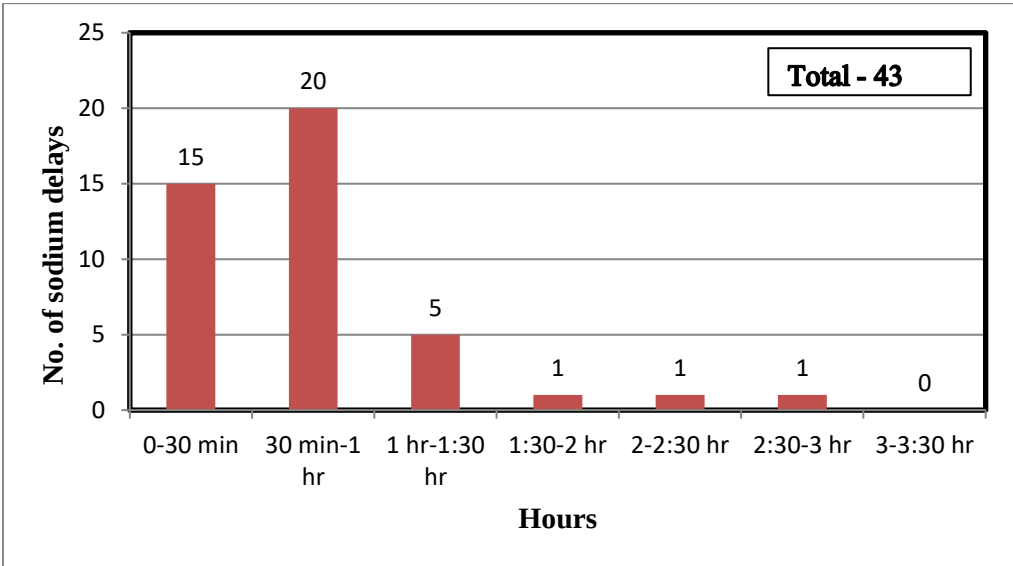
Chloride ions: 11.6%

Bicarbonate ions: 10.7%

Per parameter analysis of delay

The standard TAT for Renal Function Test is 2 hours. Analysis of each component of test is as follows:

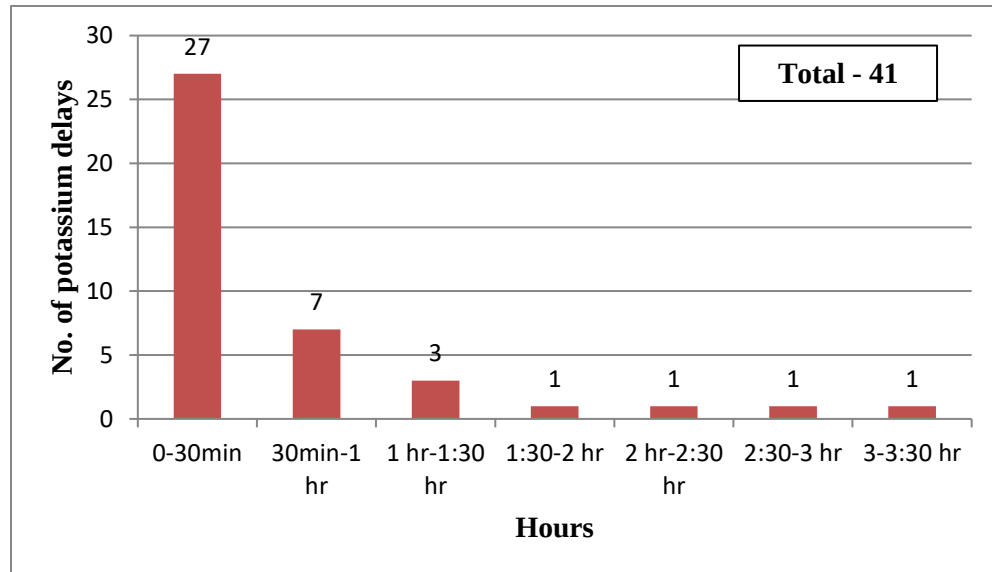
Graph 2: Analysis of delay in sodium ion test



Interpretation

Out of 43 delays, 20 delays were between 30-60 minutes above standard time of 2 hours .

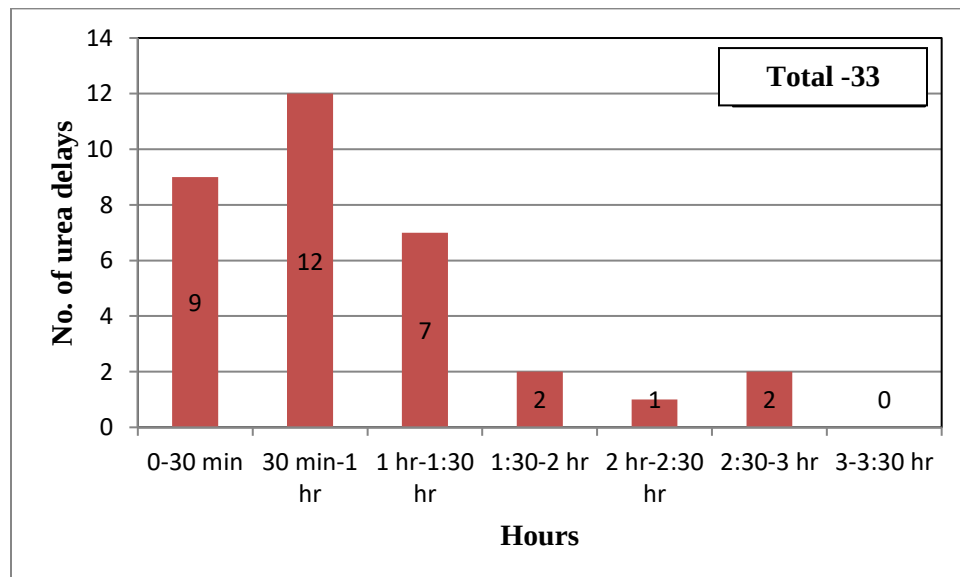
Graph 3: Analysis of delay in potassium ion test



Interpretation

Out of 41 delays, 27 delays were within 30 minutes beyond the standard time of 2 hours .

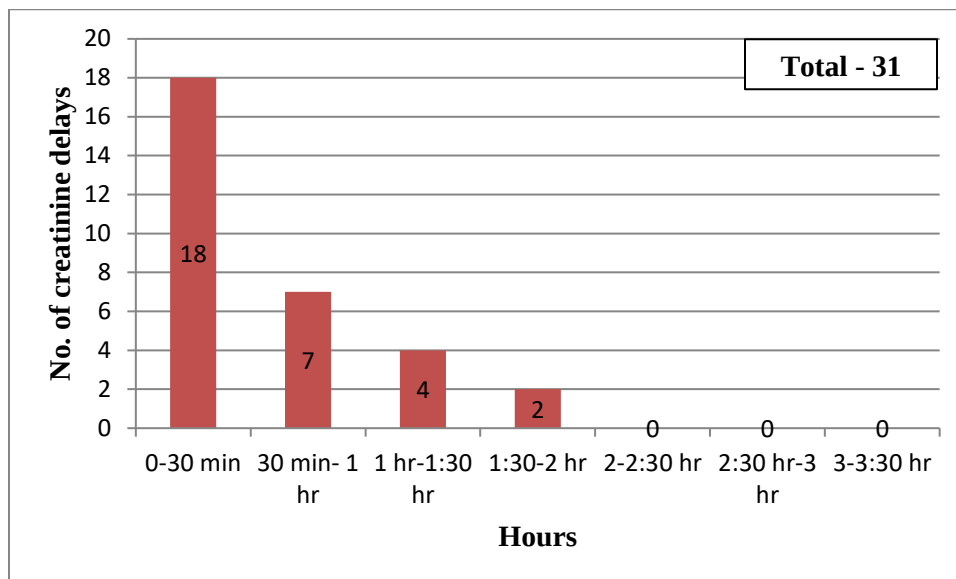
Graph 4: Analysis of delay in urea test



Interpretation

Out of 33 delays, maximum delays were between 30 minutes to 60 minutes above standard time of 2 hours .

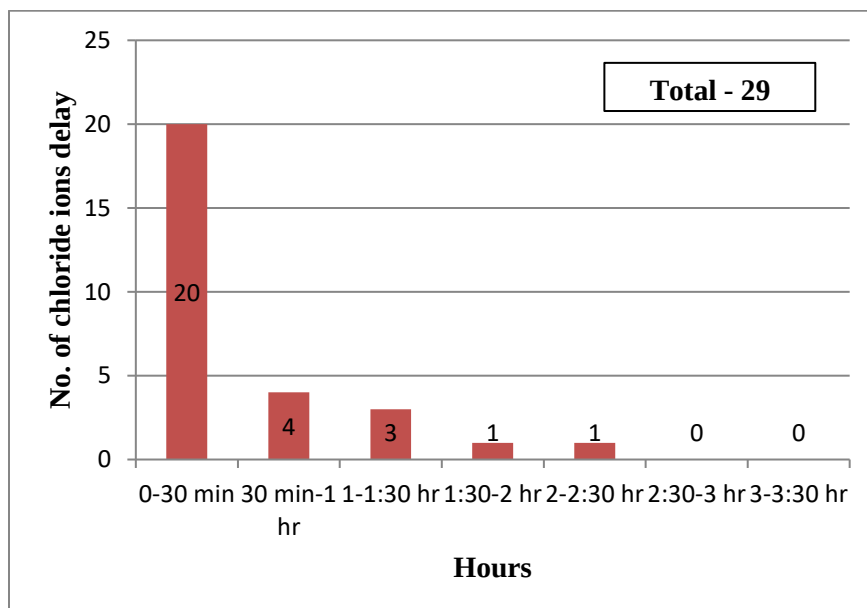
Graph 5: Analysis of delay in creatinine test



Interpretation

Out of 31 delays, 18 of them were within 30 minutes beyond the standard time of 2 hours .

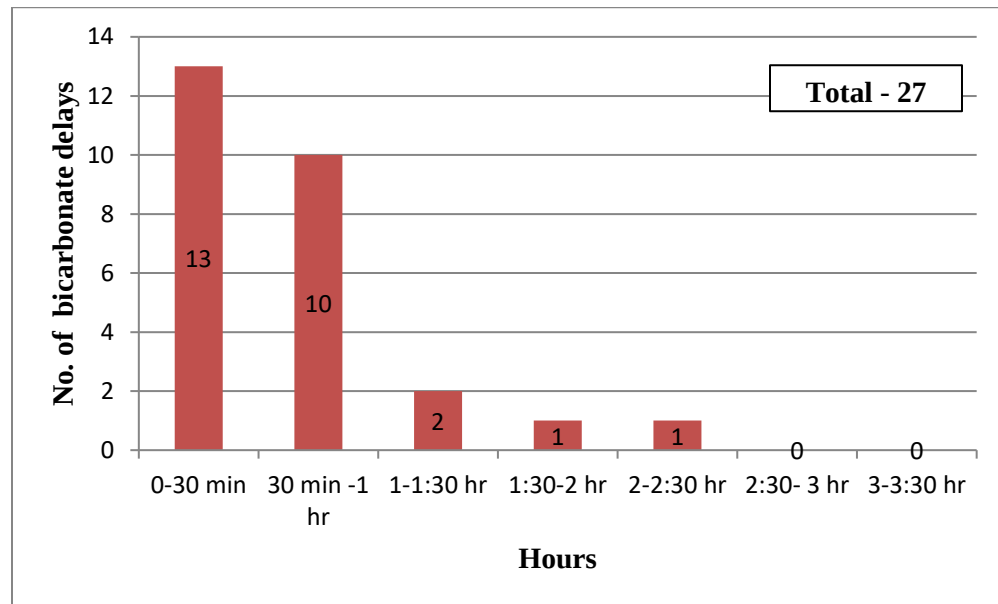
Graph 6: Analysis of delay in chloride ions test



Interpretation

Out of 29 delays, 20 delays were within 30 minutes beyond the standard time of 2 hours .

Graph 7: Analysis of delays in bicarbonate ions test

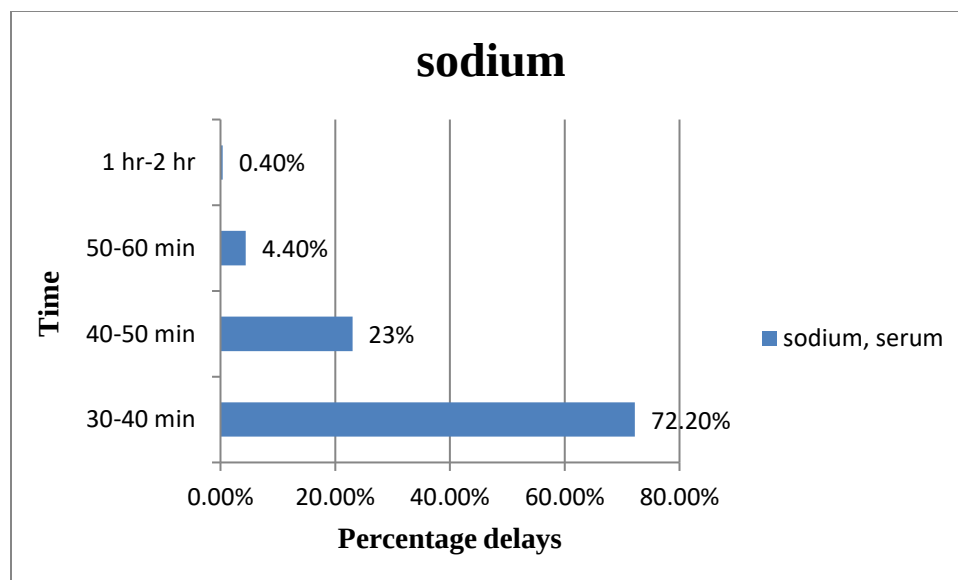


Interpretation

Out of 27 delays, 13 delays were within 30 minutes beyond the standard time of 2 hours.

Analysis of delay from nurse's collection to sample requisition in lab

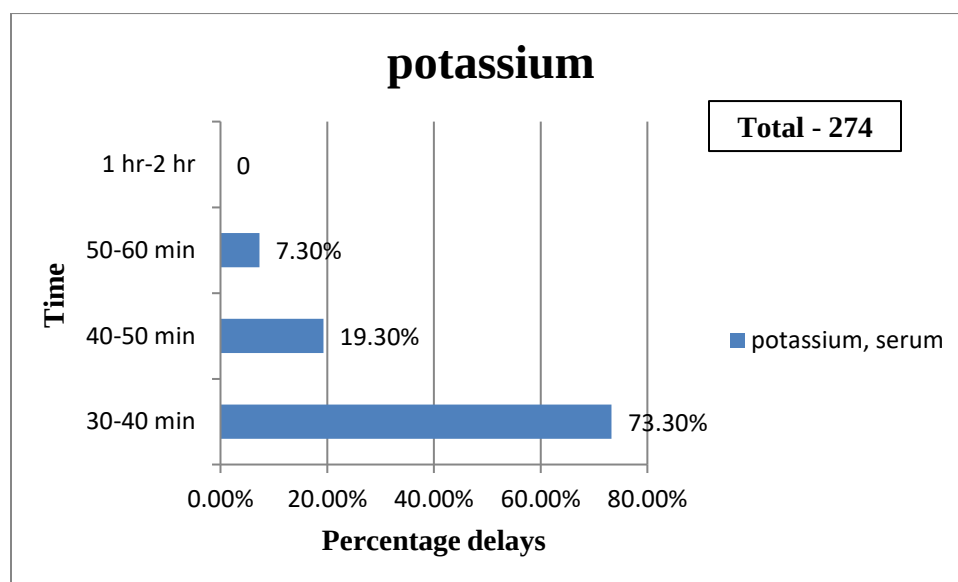
Graph 8: Analysis of delay in sodium ion test



Interpretation

72.2% samples reached the lab 30-40 minutes after nurse's collection, 23% samples after 40-50 minutes of collection, 4.4% samples reached the lab after 50-60 minutes of collection and 0.4% samples reached the lab in 1-2 hours after collection .

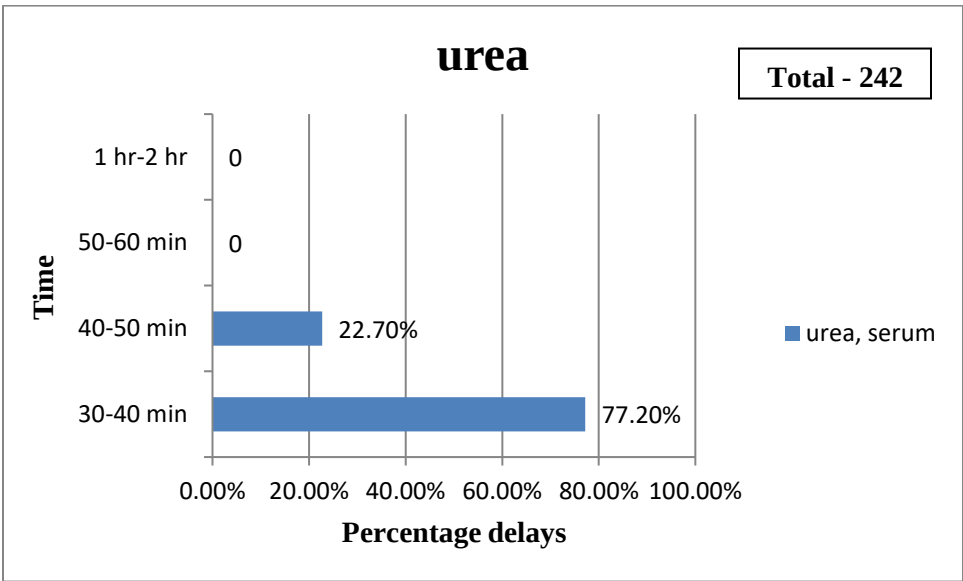
Graph 9: Analysis of delay in potassium ions test



Interpretation

73.3% samples reached the lab 30-40 minutes after collection, 19.3% samples reached the lab 40-50 minutes after collection and 7.3% samples reached the lab 50-60 minutes after collection.

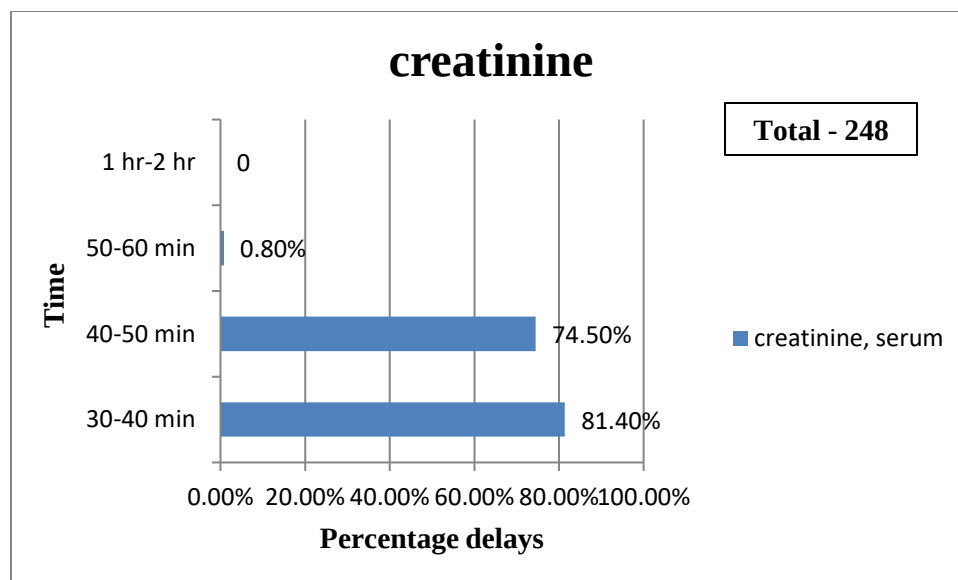
Graph 10: Analysis of delay in urea test



Interpretation

77.2 % samples reached the lab 30-40 minutes after collection and 22.7% reached 40-50 minutes after collection .

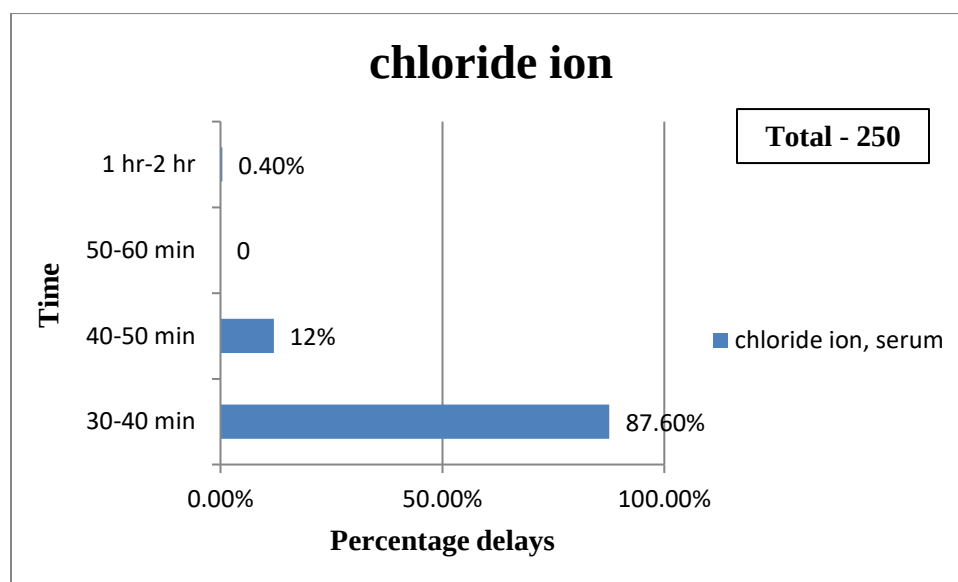
Graph 11: Delay time from nurse’s collection to sample requisition in lab for creatinine



Interpretation

81.4 % samples reached the lab 30-40 minutes after collection, 74.5% samples reached the lab 40-50 minutes after collection and 0.8 % samples reached the lab 50-60 minutes after collection .

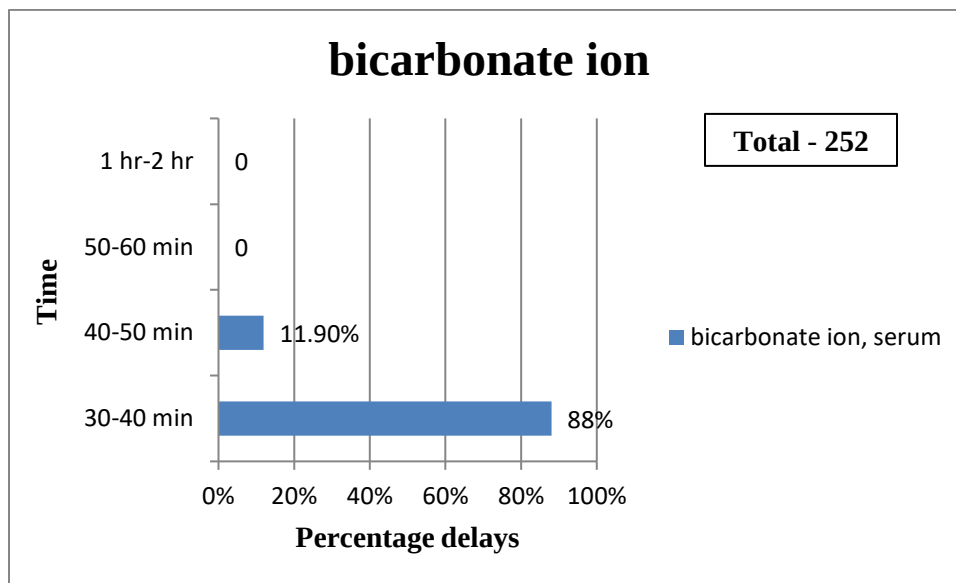
Graph 12: Delay time from nurse's collection to sample requisition in lab for chloride ion



Interpretation

87.6 % samples reached the lab 30-40 minutes after collection, 12% samples reached the lab 40-50 minutes after collection and 0.4% samples reached the lab 1-2 hours after collection .

Graph 13: Delay time from nurse's collection to sample requisition in lab for bicarbonate ion



Interpretation

88% samples reached the lab 30-40 minutes after collection and 11.9% samples reached the lab 40-50 minutes after collection .

REASONS OF DELAY :

- Only a single staff to collect and transport the sample to the laboratory
- Delay in sample requisition due to the absence of staff to receive the sample in laboratory
- Samples being loaded late in the equipments by the lab technician
- Lack of proper maintenance of equipments
- Delay in entering result in the system
- Rejected samples

SUGGESTIONS

- Better work management by lab staff by providing them training.
- Roster should be prepared so that a staff is always present to receive the sample and to enter the result in the system.
- More number of staff for collection and transfer of samples.
- Proper technique should be used to collect blood samples to avoid hemolysis and thus sample rejection.
- Sample should be drawn with the help of clot tube.
- Proper calibration of equipments, weekly audit for calibration.

ANNEXURE

Check list

Part 1: Patient information

- Name
- Age
- Sex
- Occupation

Part 2: Renal Function Test Timings

- Nurse Collection time
- Nurse sample delivery time
- Sample Requisition time
- Test verification time

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