

Correlation Between Laboratory Markers and Patient Outcomes in Sepsis: A Study Across Brazilian Hospitals

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ABSTRACT

Sepsis and septic shock are medical emergencies that require prompt evaluation and treatment; in the case of sepsis patients, the prognosis is improved by early discovery and medication initiation. Giving antibiotics to sepsis patients as soon as possible is one of the most significant ways to lower their in-hospital death rates. At first demonstration, it may be challenging to differentiate between Sepsis and septic shock. The clinical manifestations of Sepsis are highly variable, with a broad differential diagnosis and presenting symptoms that might not be immediately apparent. A comprehensive laboratory workup, comprising liver function tests (LFTs), blood lactate, chemical panel, and complete blood count with differential (CBC), is performed on patients suspected of having Sepsis. The research was based on primary data analysis to determine the data using SPSS software and generate results that included descriptive and correlations. The condition must be categorized based on severity using clinical and laboratory data. The SOFA score, useful for prediction and treatment, defines Sepsis. The overall result found that there is a direct and significant correlation between laboratory markers and patient outcomes in Sepsis. This scoring method allows doctors to evaluate organ failure, a hallmark of Sepsis and septic shock, and the respiratory, cardiovascular, hepatic, renal, haematologic, and central nervous systems. Elevated ratings suggest a higher anticipated death rate and the potential requirement for critical care.

Keywords: Laboratory Markers (LM), patient Outcomes (PO), Sepsis (SS), Brazilian Hospitals (BH)

INTRODUCTION

The word Sepsis refers to a special condition of the body in body's response of the body to infection becomes uncontrolled and this condition may cause severe inflammation in the body. There are a variety of causes of this particular disease. These causes include bacterial, viral, fungal, or parasitic infections. There are a variety of symptoms of this pathetic disease. These symptoms include severe fever or hypothermia, organ dysfunction such as of kidney and liver, rapid heart rate, rapid breathing rate, low blood pressure, and others. In this introduction, we will overview the correlation between laboratory Markers and Patient Outcomes in the case of Sepsis, particularly in Brazilian Hospitals[1]. This particular disease, named Sepsis, occurs in various stages. The first stage of this disease is systemic inflammatory response syndrome, abbreviated as SIRS. The second stage of this disease is called Sepsis. The third stage is called severe Sepsis, and the Fourth and final stage is called sepsis shock. This disease is most concerning in healthcare sectors because of the severity of complications that Sepsis can cause. These important complications include organ failure, especially of kidney and liver, respiratory failure in most cases, cardiac arrest, and ultimately death. It has been seen that the number of cases of Sepsis is increasing day by day in Brazil. Recent medical studies proved that the incidence density of Sepsis is almost 57m9 per 1000 people in Brazil. This figure shows that when diagnostic tests were performed for 1000 people, 57.9 people got Sepsis. Although the symptoms of this disease are normal, there is a high mortality rate in Brazil because of Sepsis. The highest mortality rate because of Sepsis is recorded at 21.8 per cent[2]. If we describe the mortality rate according to each stage of Sepsis, we may note that the mortality rate because of SIRS is 24.2 percent, 33.9 percent for Sepsis, 46.9 percent for severe Sepsis, and 52.2 percent for septic shock. In the laboratory, different biomarkers can be used to effectively diagnose different factors included in Sepsis. For example, as described earlier, there is uncontrolled inflammation in the body as a result of this

disease, so there are some specific biomarkers for identifying inflammation in the body. These important biomarkers are C reactive protein, which is abbreviated as CRP, pro-calitonin, interleukin 6, interleukin 1 beta, and tumor necrosis factor-alpha. Let's talk about the identification of inflammation in the body by using biomarker C reactive protein. We may know that this is an acute phase protein, which is named C reactive protein, and this protein is produced by the liver in response to inflammation[3]. It can be used for the detection of inflammation in three steps. The first step is the production of C reactive protein, which is stimulated by interleukin 6. Then, this C reactive protein binds to phosphocholine, a main component in the cell walls of bacteria. The third and main step is that the elevated level of C reactive protein in the body indicates the factor of inflammation in the body. Some other biomarkers can be used to diagnose infection in the body as a result of Sepsis. These important biomarkers are blood cultures, complete blood count with differential, erythrocyte sedimentation rate, and neutrophile to lymphocyte ratio. When we use blood cultures for the diagnosis of sepsis in the body, we may know that blood cultures are important laboratory tests that can be effectively used to detect microorganisms in the bloodstream. Their Blood cultures have roles of blew diagnosis of Sepsis sepsis[4] The first role of blood culture is that it can confirm infection by detecting the presence of pathogens in the bloodstream. Secondly, it can identify the exact pathogen that has caused Sepsis. As we know, there are various reasons for Sepsis, so it is mandatory to identify the exact pathogen so that treatment can be provided accordingly. The third role of blood cultures in the diagnosis of Sepsis is that they can also be helpful in the selection of antibiotics for the treatment of Sepsis. The fourth role of this biomarker is that it can be easily used to monitor treatment response in the human body. Various blood cultures catoe diagnose agnosis of Sepsis. These important types of blood cultures are aerobic, anaerobic, fungal, and viral cultures. If there is a positive

interpretation of blood culture, it shows a presence of the pathogen in the blood that has caused Sepsis[5]. If the interpretation is negative, then there is no existence of pathogens in blood. Some other biomarkers can be used to diagnose organ malfunctioning as a result of Sepsis. These important biomarkers are creatinine, which can be used to diagnose malfunctioning of the kidney; liver function test, which can be used to monitor the health of the liver; lactate test, which can be easily used for monitoring metabolism in the body; troponin, which can be used to diagnose cardiac injury, brain natriuretic peptide which can be used for detection of cardiac dysfunction. Suppose we use creatinine as a Biomarker for identifying Sepsis in the body. In that case, we may come to know that creatine is a kind of waste product mainly produced as a result of metabolism in muscles, and this product is mainly filtered by kidneys[6]. There are a few important roles of creatinine in the diagnosis of Sepsis. The first role is that it can be used to assess kidney function. The elevated level of creatinine in the body indicates kidney dysfunction. Secondly, it can also be used to detect any possible kidney injury [7]. A few important kidney dysfunctions are caused by Sepsis, such as hyper-perfusion, inflammation, oxidative stress, microvascular dysfunction, and others[8]. Although these biomarkers have much importance for the diagnosis of Sepsis, there are some limitations in it, such as sometimes the elevated level of biomarkers may be because of some reason other than Sepsis. Sometimes, we may have overlapping values, which can interpret results incorrectly [9, 10]. The definition of Sepsis provided by the Society of Critical Care Medicine (SCCM) Sepsis-3 criteria refers to life-threatening organ failure caused by a dysregulated host response to infection. Sepsis and septic shock are leading causes of death globally, accounting for one in three to one in six fatalities in patients with proven Sepsis.

Research Objective

The main objective of this research is to understand the correlation between laboratory Markers and Patient Outcomes in Sepsis, particularly in Brazil. This study effectively explains different aspects related to it.

LITERATURE REVIEW

Researchers claim that predictive values determine the number of active cases of Sepsis. The severity of symptoms of endocarditis makes the predictive value of Sepsis for this disease a little difficult to estimate. To estimate the deaths caused by endocarditis infection, the use of SOFA predictive values holds importance[11]. Studies suggest that Sepsis is a condition that occurs due to infection caused by various diseases. It is regarded as an inflammatory syndrome that mostly affects patients in the ICU. The immune system becomes deactivated during the onset of Sepsis and the organs become dysfunctional. For diagnosing the problems caused by Sepsis, the use of diagnostics clinical methods is made in health care sectors [8]. Studies claim that around four percent of hospitalized patients get Sepsis while they stay in the ICU. The rate of septic shock in these patients is twenty-three percent. The condition of patients having twenty-three percent sepsis chances becomes worse. Sepsis triggers negative health outcomes in people with AF[12]. Scholars suggest that the risk of MDRO increases in hospital patients and the mortality rate due to it spikes. Critical patients of the hospital are more susceptible to getting MDRO due to sepsis[13]. Studies show that medical ED is ED saare for ptoi provide gency aid to sepsis patients. The timely identification process of Sepsis

sepsis challenging task and thus requires a proper medical framework. The ratio of neutrophil levels to lymphocytes is a diagnostic therapy for early-stage Sepsis[14]. Also, Sepsis is an uncontrolled infectious disease that spreads quickly in patients with a poor immune system. To control the deadly effects of sepsis in a timely manner, presentation protocols are followed in hospitals by developing preventive measures, tackling the problems associated with Sepsis becomes easy. For a detailed study of Sepsis, the pathology of the disease at the molecular level is observed[15]. Studies conclude that various biomarkers are used in understanding the disease complexity caused by Sepsis. The organs of patients become dysfunctional during sepsis condition, and for evaluation, almost two fifty biomarkers have been developed in the last few years. Clinicians predict the biomarkers act as early detection agents for Sepsis[16]. Studies claim that there are different types of Sepsis in different patients. In pregnant women, Sepsis is regarded as maternal Sepsis that causes septic shock in them. The blood sample obtained from pregnant sepsis patients predicts that ten percent of pregnant women have simple Sepsis while forty percent face septic shock conditions. To treat and diagnose these women, the use of antibiotics recommended by the Aware classification is made in clinical procedures[17]. Studies made by scholars suggest that coronavirus causes hypertension in people along with other deadly impacts. Laboratory techniques used for treating respiratory infection also provide treatment for coronavirus. Southern Brazilian health centers provide clinical profiles related to different diseases for timely cure[18]. Studies show that the complexity associated with Sepsis makes its treatment challenging. Different factors like inflamed blood vessels and inactive immune systems trigger the complexity of Sepsis. Patients with sepsis in the ICU are provided with CRP-albumin-lymphocytes in the required proportion to treat severely ill patients[19]. Studies suggest that estimating the serum lactate level in patients provides information about Sepsis. Sepsis ill patients that die because of Sepsis have higher AG level. By predicting the level of serum lactates it becomes easier to provide early treatment therapy for Sepsis. Also, detecting the levels of AG ions predicts the possible effect of Sepsis on patient[20]. Scholars conclude that hypocholesterolemia is a condition that mainly impacts sepsis patients. The chance of mortality in people with hypocholesterolemia increases along with the high complexity of Sepsis. In ICUs, the critical patients undergo observational checkups to see the triglyceride level and in patient. The high level of cholesterol and fats observed in sepsis patients makes their disease more complex and thus results in hypocholesterolemia[21]. Several scholarly investigations reveal that the RBC distribution ratio to albumin level acts as a biomarker for estimating prognostic factors associated with sepsis condition[22]. Studies suggest that timely disease prediction of neonatal Sepsis is a clinical process. Various clinical models predict that in thirty days clinical trial process the mortality rate increases in neonatal sepsis patients[23]. Studies predict that amount of people getting an oral infection in the intensive care units is higher as the germs of various disease are present in the environment. Routine oral checkups are carried out on ICU patients to decrease the chances of oral diseases spreading. Ulcer on the lips and oral bleeding is observed in patients with Sepsis who are affected by the oral disease[24]. Studies show that the complication of any disease is one of the leading factors that causes high mortality rates. Odontogenic disease is one of the disease severities of Sepsis. The laboratory test made on sepsis patients with odontogenic infection requires immediate hospitalization. Computed techniques analyze the report provided by laboratories and then provide information regarding the stay of

patients in the hospital ICU [25]. Studies predicted the kidney problems onset in sepsis patients. The census made by ADQI suggests that acute kidney disease is the result of Sepsis. the evaluation of the timing and incidence rate of kidney problems in sepsis patients provides an opportunity for early diagnosis [26]. Scholars claim that children are more prone to disease due to the rapid spread of bacterial strains in their bodies. the DS is a disease onset sign developed by WHO. The onset of v in small children is predicted through the DS sign. the studies made on bacterial Sepsis reveal that only some strains of bacteria cause significant abnormalities in children. but in some special cases, bacterial Sepsis is a deadly disease [27]. Studies show that in Brazil, the disease-causing mortality in sepsis patients is Candidemia. the Brazilian Society of Infectious Disease played a significant role in examining the condition of Candidemia in hospitalized patients. The blood cultures obtained from the disease patient predict that *Candida spp.* Is cause behind the Candidemia. Brazilian Health Society provides various guidelines for treating Candidemia condition. these guidelines vary differently for different time periods after the onset of the disease. The survival rate of patients provided with echinocandian therapies increases. but for long-term recovery and treatment, the use of fluconazole is recommended by health professionals [28]. Scholars suggest that improving health services in medical sectors is possible by identifying the cause behi of disease condition. The determination of the risk of IMV-related diseases is essential to providing reliable treatment therapy to patients. moreover, assessing the risk factors as well as epidemiological factors associated with IMV patients provides insight into the reasons behind the cause of death of ventilated ICU patients [29].

Methods

The research study determines the correlation between laboratory markers and patient outcomes in Sepsis. The research based on primary data analysis for determine the data used SPSS software and generate result included descriptive and correlations coefficient. Sepsis is considered one of the emerging and pathetic health issues in Brazil. The complex symptoms and variety of complications have centered the attention of healthcare professionals towards itself. The incidence density and mortality rate because of Sepsis is relatively high in Brazil as compared to the rate of other health issues. For this purpose, diagnostic methods need to be accurate, perfect, and advanced to diagnose Sepsis. The in-depth study of the correlation between laboratory Markers and Patient Outcomes in Sepsis has important implications.

Early Diagnosis of Sepsis, Risk Stratification, Guidance Related to Antibiotic Therapy, Monitoring the Response of the Body to Treatment

The diagnosis of Sepsis is based on the identification of different factors in the body that are related to Sepsis. For example, there is uncontrolled inflammation in the body due to Sepsis, so there are some inflammation-associated biomarkers. These biomarkers are used to diagnose the cause of inflammation in the body; thus, indirectly, it is used to diagnose Sepsis in the body. For example, one of these Biomarkers is the C reactive protein in the body. Therefore, protein is produced by the liver in response to inflammation. So, when there is such protein in the body, it means there are symptoms of Sepsis in the body. That's the biomarker method is a Better and more effective way to diagnose Sepsis. So, the important implication of these Biomarkers

is that they can be helpful in the early diagnosis of Sepsis. The next important implication of the correlation between laboratory Markers and Patient Outcomes in Sepsis is risk Stratification. As we know, some groups of the population are at a higher risk of getting the disease Sepsis than other remaining populations. It is because of those high-risk groups' weak immune systems and genetic basis of. The main benefit of studying biomarkers for the diagnosis of Sepsis is that it can provide information about risk groups, thus helping in risk Stratification. In this way, better diagnostic methods and effective treatment can be provided to these risk groups. The other important implication of the correlation between laboratory Markers and Patient Outcomes is the guidance related to antibiotic therapy. Recent medical studies have proved that there are various reasons for Sepsis, such as bacterial infection, fungal infection, viral infections, and others. When these biomarkers are used for the diagnosis of Sepsis, there is knowledge of the true reason for Sepsis, and thus, accurate treatment can be provided to patients. In this way, these biomarkers are used for guidance related to antibiotic therapy that must be provided to treat sepsis patients. The other important implication of correlation between laboratory markers and patient outcomes is monitoring the body's response set. Biomarkers are specified according to the main reason for Sepsis. For example, inflammation-related Biomarkers, organ failure biomarkers, dysfunction of immune system biomarkers, and others. In this case, when specific treatment is provided to sepsis patients, there is a need for continuous monitoring of the body's response to this particular treatment. In some cases, the body may give a positive response to treatment. In other cases, the body may respond negatively to treatments. These important implications suggest that biomarkers can be effectively used to diagnose and treat Sepsis.

Understanding of Sepsis Pathophysiology, Clinical Trial Designs, and Validation of Biomarkers

As in most cases, Sepsis is caused by any pathogen such as bacteria, viruses, fungi, or some other pathogen. So, it is crucial to understand the way these pathogens in the body function to cause Sepsis. The working of biomarkers in the body helps us understand the functioning of these pathogens. For example, some specific pathogens cause inflammation, others may cause muscle itching, and some pathogens may cause dysfunction of organs. When the physiology of these pathogens is understood well, it can be better for accurate diagnosis of Sepsis along with guidance of treatment as well. So, it is an important implication of laboratory biomarkers that they can help in understanding the pathophysiology of Sepsis. The other important implication of using laboratory markers for the diagnosis of Sepsis is the clinical trial design. As trials are an essential part of discovery and investigation in medical science, there is a constant need to perform these trials to get better ways of diagnosis and treatment. These laboratory biomarkers are also helpful in that they are beneficial in designing these important clinical trials for effective diagnosis and treatment of sepsis. The other important implication of using these laboratory biomarkers for the diagnosis and treatment of Sepsis is checking the validation of biomarkers. There are some biomarkers whose disturbed level cannot be helpful in the diagnosis of Sepsis. For example, there may be some other reasons for increased creatinine levels in the body instead of having only one reason for Sepsis. In this way, we can say that sometimes these biomarkers cannot be used to accurately diagnose Sepsis. In this way, this study related to laboratory Markers can be useful for checking the validation of biomarkers for Sepsis diagnosis and treatment.

Policy Development Related to Health and Resource Allocations

Medical studies proved that Sepsis is an infectious disease caused by bacteria, viruses, or fungi. So, there is a need to take preventive measures to reduce contact with these microorganisms so that the major population of that area may not get Sepsis. In this way, these studies related to laboratory Markers can be useful for policy

development related to health. These policies will minimize the risk of the onset of Sepsis because of infection. The other important implication of laboratory markers for the diagnosis of Sepsis is resource allocation. As described earlier, some groups are at high risk of getting Sepsis, so resources must be allocated to areas where there is a risk of Sepsis.

Table 1: Result of ANOVA

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Laboratory Markers 1	Between Groups	.292	2	.146	.552	.579
	Within Groups	12.689	48	.264		
	Total	12.980	50			
Laboratory Markers 2	Between Groups	.116	2	.058	.107	.898
	Within Groups	25.806	48	.538		
	Total	25.922	50			
Laboratory Markers 3	Between Groups	1.655	2	.828	1.569	.219
	Within Groups	25.325	48	.528		
	Total	26.980	50			

The above results of table 1 describes that the ANOVA test analysis results represent the sum of square values, mean square values, the F statistic and significant values of each variable included independently. Laboratory marker 1 is the main independent variable result shows that its sum of square values is 0.292, and 12.689 describe a positive sum of square rates. The F statistic value is 55%, also the significant value is 57% respectively. Laboratory markers 2 describe

that the F statistic value is 0.107, showing a positive rate, and the significant value is 89% respectively. Laboratory marker 2 is another independent variable result describing that the sum of square value is 0.116, the t statistic rate is 0.107, and the significant value is 89%, respectively. Laboratory marker 3 represents that the F statistic rate is 1.569, and; the significant value is 21% within the group and between the groups.

Table 2: Result of Coefficients

		Coefficients				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.085	.454		4.596	.000
	Laboratory Markers 1	-.096	.187	-.074	-.512	.611
	Laboratory Markers 2	-.008	.134	-.009	-.060	.952
	Laboratory Markers 3	-.189	.131	-.209	-1.441	.156

a. Dependent Variable: Patient Outcomes

The results of table 2 demonstrates that linear regression analysis results describe unstandardized coefficients, including each independent variable's beta value and standard error value. The result also describes that standardized coefficient analysis results also present the t statistic rate and significant value of each variable. The beta value of laboratory marker 1 is -0.096, its t statistic rate is -0.512, and the significant value is 0.611, showing that it is negative, but it is a 61% significant in link with patient outcomes. The laboratory marker 2 is another independent variable result describing that the t statistic rate is -0.060 and the significant rate is 95% respectively. Laboratory markers 3 describe that the t statistic value is -1.441 the significant rate is 0.156, showing that there is a negative but 15% significant link with patients' outcomes.

Aetiology and Epidemiology

According to estimates, there are 189 hospital-treated cases of Sepsis for every 100,000 person-years. Sepsis treated in hospitals is thought to have a 26.7% death rate. According to estimates, there are 58 cases of ICU-treated Sepsis for every 100,000 person-years, and 41.9% of those cases result in death prior to hospital release. In addition to being a major source of morbidity for individuals who survive the illness, Sepsis also has a substantial financial impact on healthcare. This data is probably underestimated because of changing definitions of Sepsis and differences in institutional protocols for diagnosing and treating suspected cases. Most research on Sepsis

comes from wealthy nations; the actual prevalence of Sepsis is probably far greater and will rise further as more information becomes available. The Sepsis-3 criteria define organ dysfunction as an acute change in the overall SOFA score of more than two points as a result of the infection. Urinary tract infections and bacterial pneumonia are the most frequent infection causes in Sepsis. Chest radiography and urinalysis are often advised when no clinically evident cause of infection exists. Sepsis can also result from viral infections; common viral pathogens include SARS-CoV-2 and influenza. Sepsis can also result from fungal diseases. Candida spp. cause more than 90% of fungemia-induced sepsis cases; patients who have had invasive Candida infections in the past, are on total parenteral nutrition or corticosteroids, have chronic vascular catheters, or are neutropenic are at high risk.

Specimen Requirements and Procedure

Appropriate preanalytical specimen management, which addresses specimen collection, transport, storage, and rejection criteria, is necessary to maximize diagnostic accuracy. The quality of the specimen affects how test findings should be interpreted. Physicians must choose and collect samples from appropriate body parts, follow established procedures, and send the samples to the lab as soon as possible. Improving preanalytical procedures involves thoroughly understanding laboratory needs through education and training, good communication between laboratory and clinical staff,

and easy access to laboratory references through a website or portal. A patient's treatment and results can be directly impacted by therapeutic decisions, length of stay, hospital and lab costs, and laboratory productivity—all of which can be influenced by erroneous or improperly obtained specimens. To identify any new or worsening organ dysfunction in patients with proven or suspected infection, clinical and laboratory examinations are part of the first therapy for patients with suspected Sepsis. An analysis of the infection's origin should include samples of bacteria and viruses and the findings of urinalysis.

Blood Specimens

For laboratory tests, including a complete blood count (CBC) and clinical chemistry, blood samples must be taken. Because each tube has a different set of additives depending on the test that has to be done, samples should always be drawn into the appropriate tube. Blood collection tubes with a lavender cap should gather samples for a complete blood count (CBC); EDTA is required for irreversible anticoagulation in haematology tests. Samples collected in light blue-capped blood tubes containing sodium citrate, a reversible anticoagulant, should be used for coagulation investigations. Samples collected in red- or light-green-capped blood sample tubes are used for clinical chemistry and immunochemistry testing. Samples containing just serum or samples anticoagulated with lithium-heparin are tested. More than errors in sample collection or poor methodology might cause delays in diagnosis and treatment. Hemolysis, inadequate specimen volume, incorrect container use, and excessive clotting are common reasons for specimen nonconformity.

Blood Cultures

Antibiotics should preferably be administered after obtaining blood cultures, although therapy shouldn't be postponed. Blood cultures taken after starting antibiotic therapy have been associated with higher hospital stays and healthcare expenses, as well as a potential decreased yield. Unless acquiring cultures would cause a delay in the administration of antibiotics, blood cultures should be

acquired as soon as practicable. It is advised to use two sets of cultures in four bottles—two aerobic and two anaerobic bottles with a total draw of around 30 to 40 milliliters. To prevent erroneous negative findings, 8 to 10 mL of blood should be placed in each container. However, because white blood cells produce a lot of CO₂, overfilling the bottles might result in misleading positive readings. Disposable gloves and hand hygiene should be followed when collecting specimens. Depending on the rates of contamination in the area, sterile gloves may be taken into consideration institutionally. Blood cultures normally take 4 to 7 days to fully incubate, and after 5 days, 99 percent of the pathogens are found.

Viral Specimens

Early in the infectious phase is when viral specimen yields are highest; samples should be collected and examined for the most likely agent according to the patient's age, history of exposure, immunizations, and immunological state. The sort of specimen to be collected should depend on the symptoms that are now present and the likely site of infection. The virus that is causing the infection determines how long viremia lasts. Samples of blood or urine can be used to treat systemic infections like measles or arbovirus. In situations of enteric viral disease, such as poliovirus or rotavirus, stool samples may be collected. In individuals exhibiting indications of respiratory disease, respiratory tract sampling with nasopharyngeal or oropharyngeal swabs with Dacron or Rayon tips may be performed. Samples of cerebrospinal fluid may be necessary when a central nervous system infection is suspected. During the acute stage of a viral disease, reverse transcription polymerase chain reaction (RT-PCR) is frequently employed to detect viral pathogens. Testing for antibodies, in this case IgM, is done few days after the beginning of symptoms. For viral molecular testing, a blood sample volume of 2 to 10 mL is needed. Anticoagulants have been reported to hinder PCR, hence EDTA tubes are recommended. Serum separation tubes (SST) allow red blood cells and serum to be separated by centrifugation, making clotted blood a suitable sample for serology testing. From EDTA or clotted blood samples, viral isolation may be achievable, depending on the infection.

Table 3: Result of ANOVA^a

TABLE 7. Result of ANOVA						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.029	3	.343	.771	.516 ^b
	Residual	20.893	47	.445		
	Total	21.922	50			

a. Dependent Variable: Patient Outcomes

b. Predictors: (Constant), Laboratory Markers 3, Laboratory Markers 1, Laboratory Markers 2

The results of table 3 demonstrate that ANOVA^a test analysis of each model included regression and residual. The regression model describes that sum of square rate, the mean square rate F statistic rate and significant rate of regression and residual model. According to the result its sum of square value is 1.029 the mean square value is 0.343 the F statistic rate is 0.771 also that significant value is 51% respectively shows positive and significant link with them. similarly, the residual model describes 20.893 rate of sum square values its mean square rate is 44%.

Conclusion and Recommendations

To improve patient-centered treatment and results, healthcare professionals including doctors, nurses, patient care technicians, and chemists must work together to manage Sepsis and septic shock. The best strategy for reducing in-hospital mortality in sepsis patients is

early detection of the illness and antimicrobial therapy treatment. Because Sepsis has a wide differential diagnosis, diagnosing it can be challenging. To do this, a combination of laboratory data, clinical examination, and vital signs utilizing multiple screening measures (e.g., SIRS, qSOFA, SOFA, NEWS, and MEWS) are needed.

The diagnosis, risk assessment, and prognosis of Sepsis depend on a comprehensive laboratory workup that includes CBC, chemical panel, LFTs, and indicators such blood lactate. Sepsis is defined by the SOFA score, which also has predictive and diagnostic use. Patients with suspected Sepsis require close monitoring, including evaluation of the infection source, assessment of severity, treatment and avoidance of hypotension, intravenous fluids, vasopressors, antibiotics, and management of the infection source. The complexities and possible consequences of caring for septic patients should be known to medical personnel. To improve the effectiveness of the team and patient safety,

they should participate in interprofessional communication and care coordination. A thorough grasp of laboratory assessments of Sepsis can help the medical staff provide faster patient treatment and enhance patient outcomes. After an overview of these aspects of the important

implications of the correlation between laboratory Markers and Patient Outcomes in Sepsis, we can say that there is a close relationship between using these laboratory Biomarkers and positive outcomes in patients related to Sepsis.

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