ROLE OF NEUTROPHIL-LYMPOCYTE RATIO AND PLATELET-LYMPHOCYTE RATIO AS A PROGNOSTIC MARKER FOR FEBRILE SEIZURES

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DOCTOR IN MEDICINE IN PEDIATRICS

ABBREVIATIONS

NLR – NEUTROPHIL LYMPHOCYTE RATIO

PLR – PLATELET LYMPHOCYTE RATIO

FS – FEBRILE SEIZURES

SFS – SIMPLE FEBRILE SEIZURES

CFS – COMPLEX FEBRILE SEIZURES

AAP – AMERICAN ACADEMY OF PEDIATRICS

MPV – MEAN PLATELET VOLUME

RDW – RED CELL DISTRIBUTION WIDTH

MCV – MEAN CORPUSCULAR VOLUME

MCH – MEAN CORPUSCULAR HAEMOGLOBIN

IL – INTERLEUKIN

TNF – TUMOUR NECROSIS FACTOR

URTI – UPPER RESPIRATORY TRACT INFECTIONS

GE – GASTROENTERITIS

UTI – URINARY TRACT INFECTION

DM – DIABETIS MELLITUS

MPR – MEAN PLATELET RATIO

CRP – C REACTIVE PROTEIN

RBC – RED BLOOD CELL

MDS – MYELODYSPLASTIC SYNDROME

IDA – IRON DEFECIENCY ANEMIA

PICU – PEDIATRIC INTENSIVE CARE UNIT

AUC – AREA UNDER CURVE

ROC – RECEIVER OPERATING CHARACTERISTIC CURVE

FC – FEBRILE CONTROL

ABSTRACT

BACKGROUND –

According to INDIAN ACADEMY OF PEDIATRICS (IAP), The most common epileptic seizures in childhood are febrile seizures. They happen to be between the age of 6 months to 5 years with no evidence of intracranial infection, metabolic disturbance or prior afebrile seizures. A simple febrile seizure(70-75%) is generalized, lasts for 15 minutes, not associated with focal neurological deficits or multiple episodes in the same illness with no recurrence within 24 hours. Complex febrile seizures (20-25%) are characterized by focal onset, duration > 15 minutes and <30mins, associated focal neurological deficits or multiple episodes of same illness and/or recurrent within 24hours. Late-onset febrile seizures, generalized epilepsy including febrile seizure plus generalized epilepsy and febrile seizure plus and febrile status epilepticus (FSE) are part of the spectrum of febrile seizures.

The recent concept of simple febrile seizure plus has emerged which signifies recurrent episodes of febrile seizures within 24 hours which otherwise behaves like simple febrile seizures. Febrile seizures affect children between 6 months and 5 years of age and are seen in 2%- 5% of children. Complex seizures constitute 25%-30% of these seizures The American Academy of Pediatrics has told that no further diagnostic evaluations are required, except determining the source of fever, in the treatment approach to simple febrile seizures. On the other hand, in the etiology, usually a more detailed diagnostic approach is selected for complex febrile seizures because of the higher risk of recurrence and the possible presence of serious pathologies that should be treated immediately.

Currently, there are no objective parameters to determine the length of hospital stay in febrile seizures and its recurrence. Neutrophil-Lymphocyte Ratio (NLR) and Platelet Lymphocyte Ratio (PLR) is an inexpensive, easily accessible, and easily calculable parameter that has been used for

evaluation of systemic inflammation. In our study, we will investigate the significance of NLR and PLR as a prognostic marker for febrile seizures to decide the duration of stay in the hospital.

Objectives of the study

To screen all cases of seizures with fever.

- To assess the usefulness of Neutrophil-to-Lymphocyte Ratio (NLR) and Platelet.

Lymphocyte Ratio (PLR) as a prognostic marker for febrile seizures .

METHODOLOGY

This is a hospital-based prospective follow up study, in which a sample of 91 febrile seizure cases between 6 months to 5 years were included after fulfilling the inclusion and exclusion criteria. NLR was calculated by dividing the absolute neutrophil count by the absolute lymphocyte count and analyzed. Neutrophil-to-lymphocyte ratio (NLR) above 1.13 was considered as high NLR ratio. Platelet lymphocyte ratio (PLR) above 137.3 was considered as high PLR. Patients with high CRP levels (>10) were also compared with high PLR ratio and NLR ratio.

The patients were followed up for a period of 6 months for recurrence of seizures.

Results

A total of 91 children who had presented with febrile seizures were recruited in the study. The average age of the study population was 2.3 ±1.5 and 42% of the children were female. Majority of the children had elevated heart rate and tachypnea at the time of admission. , 89% of the children had simple febrile seizures and remaining 11% being complex febrile seizures . The occurrence of family history of seizure was rare in both simple and complex febrile groups. Around 13% of study population had past history of febrile seizures. 60% of children in the simple febrile seizure had elevated CRP levels compared to 80% of the children in the complex febrile seizure type. There was no significant difference between the simple and complex febrile seizure types with regard to age,

temperature, heart rate and respiratory rate. There was significant difference with regard to duration of hospital stay between the two groups.

Considering NLR of 1.13 as a cut off and high NLR, there was a strong association between high NLR and prolongationof hospital stay **[p=0.001]** implying higher the NLR higher the risk of prolongation of hospital stay. The average NLR in our study sample of febrile children was 3.86 ± 3.5

Testing for correlation between NLR values of and duration of hospitalization shows a Positive correlation (p=0.04 for Hospital stay, p=0.001 for duration of PICU stay).

The NLR AUC for predicting type of seizure is 0.56 and width of the Confidence limits are wide (95% CI- 0.38 to 0.75) implying poor predictive ability. When comparing PLR and Duration of Hospital stay there was no significant correlation between the two.

There was a significant correlation between NLR and the levels of CRP (correlation coefficient =0.3) and p = 0.009. As the levels of CRP increase the NLR also increases.

There was no correlation between NLR and seizure recurrence whereas the PLR AUC for predicting seizure recurrence is 7.1 and width of the Confidence limits are (95% CI- 0.58 to 0.83) implying good predictive ability. Thus implies that low PLR can be used as a predictor of seizure recurrence.

Conclusion

In children admitted for the febrile seizure management, high Neutrophil Lymphocyte Ratios are associated with longer duration of hospitalization. NLR can help prognosticating high risk children for providing appropriate care. NLR as a marker can help in optimizing the care of children with febrile seizures**.** The levels of Platelet Lymphocyte Ratio were significantly lower in those children who had recurrence compared to those who did not. A low PLR can be used as a predictor of seizure recurrence.

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INTRODUCTION

According to the Indian Academy Of Pediatrics (IAP), the most common epileptic seizures in childhood are febrile seizures.[1] The term "febrile seizures" (FS) refers to seizures that take place in children, between the ages of six and sixty months, in conjunction with a fever of more than 38°C (100.4°F), without any intracranial cause (head injury , known case of seizures), another specific etiology of seizure (such as an electrolyte abnormality, reduced blood sugars causing seizures, drug usage or withdrawal), or previous episode of a febrile seizure.[2] About 2-5% of children between the ages of six months and sixty months are affected by febrile seizures, which are commonly classified into simple febrile seizures (SFS) and complex febrile seizures (CFS). [2–5]

The AAP is against any additional diagnostic testing for simple febrile seizures other than identifying the cause of the fever. However, a more thorough strategy of diagnosis is chosen for complex FS due to the increased risk of recurrence and the potential for significant diseases that need to be treated right away.[6] The issue is that the majority of febrile seizures happen outside of hospitals, and parents are usually the ones who provide information on the type of seizures, which may not be accurate.

There have been numerous guidelines and recommendations to aid the management of febrile seizures in children, but there are no optimal biochemical, hematological marker or score that accurately predicts the type of febrile seizure, length of hospital stay (LOS) or complications.[1,7] Inflammatory cytokines, including IL-1, IL-6, and TNF-α, have been found to play a significant role in the development of FS, as per studies.[8] Inflammatory cytokines are helpful biomarkers, but there are limitations, including their higher price and limited availability. Therefore, objective diagnostic markers are required to identify the type of seizures which occur outside hospital.

Whole blood cell analysis is an easy and practical testing method that is available in all hospitals. It is performed on nearly all pediatric patients who visit a hospital for a normal physical

examination. Because the test can reveal important predictive indices, it is helpful for both physicians and patients. Peripheral blood NLR, MPV and RDW are the vital markers for Inflammation . NLR is a measure of the response of inflammation throughout the body and is linked to the occurrence of several illnesses, particularly malignancy and cardiovascular disorders.[9] Goksugur et al. told NLR and RDW are helpful in distinguishing between simple and complex febrile seizures.[10] Studies have also reported the increase of RDW in liver disease, CNS disease, sepsis, and cancer.[11,12] A study by Yigit et al.found that RDW could be used to distinguish between simple and complex febrile seizures. To the best of our knowledge there are no studies from India evaluating the role of NLR, PLR in febrile seizures and their influence on the Length of hospital stay. [13]

In our study, we will investigate the importance of NLR and PLR as a prognostic marker for febrile seizures to decide the duration of stay in the hospital and their recurrence.

OBJECTIVES

To screen all cases of seizures with fever.

- To assess the usefulness of Neutrophil-to-Lymphocyte Ratio (NLR) and Platelet Lymphocyte Ratio (PLR) as a prognostic marker for febrile seizures.

REVIEW OF LITERATURE

Febrile Seizures:

The most common type of childhood seizure condition is febrile seizure (FS). National Institutes of Health (NIH) defines febrile seizures as – 'an event in infancy or childhood usually occurring between 3 months and 60 months associated with fever but without evidence of intracranial infection or defined cause.[7] The International League Against Epilepsy (ILAE) defines febrile seizures as "a seizure occurring in childhood after one month of age, associated with a febrile illness not caused by an infection of the CNS, without previous neonatal seizures or a previous unprovoked seizure, and not meeting criteria for other acute symptomatic seizures[14]. The above statements convey the same except in terms of age (three vs. one month). Age , fever , and convulsions are the three major elements of the definition. They are reported to affect about 2–5% of children under five years.[1,3] By obtaining a careful history, it is necessary to rule out other seizures or clinical occurrences that could generally be like an epileptic seizure (and more significantly, a tonic-clonic one), such as rigors, syncope, reflex anoxic seizures, breath-holding spells, decreased consciousness. Population studies in the United States and Western Europe indicate a cumulative incidence of 2% to 5% .[5,15] The incidence reported from India varies between 5–10% .[3] A research study from South India found an incidence of 10.3%.[16]

FS can be classified as two groups: Simple Febrile Seizures (SFS) and Complex Febrile Seizures (CFS).[1,17]A simple febrile seizure is generalized, lasts for 15 minutes, and is not associated with focal neurological deficits or multiple episodes in the same illness with no recurrence within 24 hours. Simple febrile seizure constitutes about 80-85% of febrile seizures. The recent concept of simple febrile seizure plus has emerged, which signifies recurrent episodes of febrile seizures within 24 hours, which otherwise behaves like simple febrile seizures.[17] Complex febrile seizures are defined by focal onset, duration > 15 minutes and <30mins, associated focal neurological deficits or multiple

episodes of the same illness and recurrent within 24 hours. Late-onset febrile seizures, generalized epilepsy including febrile seizure plus and febrile status epilepticus (FSE) are part of the febrile seizures spectrum.

The highest occurrence of febrile seizures ranges between twelve and eighteen months of age.[6]The onset after six years of age is unusual. The ratio of male child to female child is roughly 1.6 to 1.[17, 18] Although most FSs instances have a favorable prognosis and won't harm children, the condition can nonetheless cause parents a lot of anxiety. A study by Sharawat et al. reported the the following risk variables are connected to the initial febrile seizure episode: Maximum mean temperature, upper respiratory infection and urinary tract infection as the source of fever, prenatal problems such haemorrhage, challenging labour, age under two years, male sex, positive family history of FS in first and second-degree relatives, decreased mean hemoglobin and Red Blood Cell indices [reduced Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH) & increased Red cell Distribution Width (RDW)].[19] Patients in the complex febrile seizure group had a younger average age than those in the simple febrile seizure group, according to Goksugur et al., although the difference was not statistically significant.[10] According to studies, male children get febrile seizures more frequently than girls.[6,18,20] After the first episode, between 30–50% of cases are likely to reoccur, the following are risk factors for FS to reoccur - child less than 1 year of age ,history of FS among family , fever with low temperature with short interval between fever onset and convulsion.[20]

Approach to Febrile Seizures:

It is required to obtain a comprehensive history that includes any family history of FS, epilepsy, and unexpected fatalities. The head circumference should be measured, and the examination should look for signs of CSF infections, neurological deficits, asymmetry, or neurocutaneous disorders or metabolic illness. There are several problems that need to be resolved: Was the episode

an epileptic seizure and not a rigor, reflex anoxic seizure , or any seizure mimicking activity ? Was it febrile, and if so, what infection was present? Are meningitis, encephalitis, or encephalopathies a possibility? A static or progressive abnormality may be a possibility?

A six-pronged strategy is being used to manage the first attack of febrile seizures: (a) To stop convulsion, (b) reduce temperature, (c) Rule out underlying sepsis of the central nervous system, (d) evaluate and treat the source of fever, (e) other relevant investigations (if necessary) (f) Counseling of parents/attenders.[20] The American Academy of Pediatrics suggests no need to perform additional diagnostic tests in the course of treating simple febrile seizures other than identifying the cause of the fever. However, a more thorough strategy of diagnosis is chosen for complex febrile seizures due to the greater likelihood of recurence and the potential for significant diseases that need to be treated right away.[6] The guidelines recommend biochemical, hematological investigations and lumbar puncture for cerebrospinal fluid in certain conditions. Additionally, Vestergaard et al. colleagues found that within two years of complex febrile seizures, the risk of unexpected death increased relative to the general population, although this ratio was the same for children who had simple febrile seizures.[21] The issue is that the majority of febrile seizures happen outside of hospitals, and parents are usually the ones who provide information on the type of seizures, which may not be accurate. This leads to a dilemma in the treatment of febrile seizure types.Therefore, objective diagnostic markers are required to identify the type of febrile seizures that occur outside the hospital.

Pathogenesis of Febrile Seizures:

Fever is a frequent problem in children, and not all of them get febrile seizures, as a result it needs to be better understood how fever generates FS. Febrile seizures onset; however, some occur during or after the development of fever, whereas others happen in initial course of sickness and may be the presenting complaint.[22,23] There are no shreds of evidence to prove that the rate of rise in temperature is significant than the highest temperature reached.[24,25] The grade of fever at the time of

the convulsion is unknown. Fever is frequently found in children following the FS. Fever is mainly due to the induction of pro-inflammatory cytokines like IL-1β, IL-6, and TNF-α at the time of infection[8]. Numerous studies have revealed that the development of FS is influenced by inflammation, which is key to the response of fever.[8,26,27] These studies are of opinion that inflammatory cytokines, especially IL-1β, IL-6 and TNF-α, play an important aspect in febrile seizure pathogenesis . One of the primary functions of IL-1 and TNF- is to directly and indirectly regulate effects on neurons and neurotoxic neurotransmitters produced during excitation or inflammation .Inflammation is also a method of innate immunity. Monocytes, macrophages , neutrophils, lymphocytes, basophils, eosinophils, and mast cells are a few of the important types of immune system cells that are involved in this process. In patients with FS, immune system activation is absolutely vital.[28]

Depending on the area, different studies have shown different causes of fever in children with febrile seizures. A study by Delpisheh et al. a number of studies conducted in Iran revealed that the most common infectious causes of FS were URTI (42.3%), Acute GE (21.5%), otitis media (15.2%), pneumonia (8.7%), UTI (3.2%), roseola infantum (2.0%), and others(12.8%). [29]

Febrile Seizures and biomarkers:

NLR, MPV, and RDW are three markers for inflammation in peripheral blood. NLR is used to assess systemic inflammation since it is low-cost, accessible, and simple to calculate. A measure of systemic neutrophil to lymphocyte ratio is called NLR. Studies have shown an association between NLR and chronic inflammation in malignancy, familial Mediterranean fever, DM , liver cirrhosis, and cardiac illnesses.[9,30,31] Inflammatory situations cause a rise in NLR, and this increase is considered to be a hallmark of systemic inflammation. RDW raises the risk of hepatic disorders, CNS diseases , sepsis, and malignancy, according to studies.[11,32] Although the exact causes of this relationship

between RDW and various illnesses are still unknown. As with NLR, it has been assumed that it is occurring as a consequence of inflammation.

Goksugur et al. opines that NLR and RDW are helpful in distinguishing between SFS and CFS.[10] NLR in their study was 2.18 ± 1.9 and 3.8 ± 4.2 , respectively, for simple FS and complex FS groups, and the difference was statistically significant. There was a significant difference between the mean RDWs for the FS (SFS and CFS groups) which were 16.1 ± 1.1 and 16.6 ± 0.8, respectively.They found that with a cutoff point of 1.98 for NLR, the sensitivity and specificity were 66.7% and 60.3%, respectively, for differentiating SFS and CFS. However, for an RDW cutoff point of 16.350, the sensitivity and specificity (59% and 58.6%) were comparatively low.

A study by Li et al. investigated the relevance of NLR, MPV, Platelets count, MPR (MPV/Platelet count ratio) and RDW in fever children with seizures and children without seizures. In this study, which involved 249 febrile children each with FS and without FS (only controls), 83.9% of the FS group demonstrated elevated NLR compared to 36.5% of the only febrile children group(without seizures). In this study, complex febrile seizures (CFS) were characterized by lower mean MPV levels and higher mean NLR levels (3.2 vs. 1.6), and these differences were statistically significant. Receiver Operating Characteristics analysis showed that the cutoff value for NLR was 2.549 with 65.9% sensitivity and 57.5% specificity.

In a retrospective study on 142 children admitted to Emergency Department, Yigit et al. showed significant difference in the NLR average value for simple and complex FS groups (2.38 ± 1.60 and 3.42 ± 1.77, respectively) and decided 2.315 as the cutoff value for NLR, with a sensitivity and specificity of 62.7% and 53.8%, respectively.

In a study conducted by Romanowska et al. in a group of 306 children admitted with fever divided into two groups (study group- with seizure, control group without seizure), C-reactive protein level in the study group was 15.73 mg/L and in the control group 58.20 mg/L33. There was a

statistically significant difference between the two groups in the number of lymphocytes and neutrophils.

The predictive cutoff for NLR proposed by various studies varies from 1.98 -2.31510.[34] If NLR does have a role as a predictive marker, further research is warranted regarding the optimum cutoff value. Kubota et al., in their study of 205 children examining the role of inflammatory markers in the classification of febrile seizure type, reported NLR and RDW can't differentiate SFS and CFS properly.[35] These studies support the view the role of NLR needs to be explored further in febrile seizures.

In their systematic review determined the association between NLR and febrile seizure, Hosseini et al. included 17 studies and reported that the febrile seizure group NLR levels were increased when compared to febrile control group. They also reported substantially higher NLR levels in the complex febrile seizure group patients when compared with the simple febrile seizure group.

RDW Limitations:

Buttarello et al. found a bias between the median RDW values in reference range of 1%–24% in their research of 220 healthy participants.[36] Independent studies have demonstrated that RDW readings from Sysmex, Mindray, and Beckman Coulter hemocytometers are consistent with one another and greater than readings from Siemens devices; readings from Abbott brand devices being the lowest of all devices.[37] There needs to be more uniformity among manufacturers when it comes to RDW measurements, despite the International Council for Standardization in Haematology's recommendations from roughly 25 years ago for standardisation in the measurement of RBC distribution curves. RDW may rise in a number of illnesses, including sickle cell anaemia, hemolytic anaemia, hepatic diseases , MDS ,IDA .[38]

Platelet-derived parameters as prognostic markers:

In various disorders, mean platelet volume (MPV) has been investigated as a basic inflammatory marker. According to some research, MPV rises in myocardial infarction and cerebral disease . on the other hand MPV levels falls in rheumatological disorders such as rheumatoid arthritis (RA), ankylosing spondylitis (AS), and ulcerative colitis (UC).[39] Recent research revealed that platelets play a significant role in inflammation and immunity in addition to hemostasis.[40] In a study by Ozadyn et al. MPV of complex febrile seizure group (7.99 fL) was reduced than that of the simple febrle seizure group (8.77 fL).

The Platelet to Lymphocyte Ratio (PLR), which is the ratio of the absolute lymphocyte count to the Platelet count, is a marker of inflammation. Like NLR, PLR is a marker for the differential diagnosis or prognostication of a wide range of diseases.

The systemic inflammatory response during the disease active phase was reflected in a study by Tang et al., finding that the PLR values of the FS and FC groups were more than those of the control group. However, significant differences between the SFS and CFS groups were found to be nil .[41] Additionally, they noted a significant difference in PLR values between the groups with and without recurrence. The PLR values of the recurrent group were much lower than those of the non-recurrent group because the platelet count of the recurrent group was much lower than that of the non-recurrent group. In a study conducted by Mathew S et al., decreasing PLR was associated with better survival in children admitted to PICU.[42] Thus, PLR can be used as a simple indicator of the severity of the inflammation as well as prognosis .[43]

Data from developing countries are limited with respect to the predictive role of hematological parameters in febrile seizures. There are limited studies from India evaluating the role of NLR and PLR in febrile seizures and their influence on the duration of hospital stay .[13]

Few prospective studies with patient follow-up after the initial febrile seizure episode exist in the Indian population to determine the factors influencing the recurrence and its relationship to subsequent epilepsy.[18]

METHODOLOGY

Study design:

It was a prospective observational study.

Study setting:

The study was conducted in the Department of Paediatrics, Shri BM Patil Medical College Hospital And Research Centre, Vijayapura

Study participants:

The study participants were recruited from the cases of seizures with fever admitted to Paediatric Intensive Care Unit (PICU), fulfilling the Inclusion and Exclusion Criteria.

Eligibility criteria:

Inclusion criteria

- All children in the age group 6 months to 5 years who have a fever with seizures.

Exclusion criteria **:**

- Familial genetic and CNS diseases
- Focal seizures
- Children with CNS malformation
- Children with Hydrocephalus
- Children with Mental retardation

Prolongation of hospital stay is considered if the duration of hospitalization exceeds 5 days.

Number of groups to be studied: Two

Group 1 – Prolongation of hospital stay

Group 2 – No prolongation of hospital stay

Study procedure:

This is a hospital-based prospective follow up study, in which a sample of 91 febrile seizure cases between 6 months to 5 years were included after fulfilling the inclusion and exclusion criteria NLR was calculated by obtaining the ratio between absolute neutrophil count and the absolute lymphocyte count and analyzed, Neutrophil-to-lymphocyte ratio (NLR) above 1.13 was taken as high NLR ratio. Platelet lymphocyte ratio (PLR) above 137.3 was considered as high PLR. Patients with high CRP levels (>10) were also compared with high PLR ratio and NLR ratio.

Follow up of children was done for a period of 6 months for recurrence of seizures.

WORK FLOW OF THE STUDY

Seizures with febrile illness admitted to PICU

⇩

Informed written consent was obtained from parent

⇩

Demographic details

⇩

History & Clinical assessment

⇩

Blood sampling and calculation of haematological parameters

⇩

Classification Simple /Complex Febrile Seizures

⇩

Additional laboratory investigations

⇩

Clinical outcome recorded (Length of hospital stay)

Sample size calculation:

With anticipated Proportion of Febrile seizures affect children 2-5%, the study would require a sample size of 75 patients with a 95**%** level of confidence and 5% absolute precision**.**

Formula used

- $\mathbf{n=\frac{z^2\ p*q}{d^2}}$

Where Z= Z statistic at α level of significance

d^2= Absolute error

P= Proportion rate

q= 100-p

The sample size was calculated using the PS software version 3.1.2.

Data analysis and statistical tests:

All the statistical analysis was done using SPSS version 20.0. Age, haematological parameters were expressed as mean and standard deviation. Other baseline characteristics data were expressed as frequency and percentage.

The study participants were divided into two groups based on whether they had simple febrile seizures or complex febrile seizures. Independent sample t-test for continuous variable and chi-square test for categorical variable was done to check if any baseline difference was there between the groups.

$p<0.05$ was considered as statistically significant for all tests.

Receiver Operating Characteristics Curve (ROC) analysis was be used for calculation of cut off value, sensitivity and specificity.

RESULTS

A total of 91 children who had presented with febrile seizures were recruited in the study. The demographic and key clinical characteristics of the study population are depicted in **Table 1.** The investigations were carried out at the time of admission.

The average age of the study population was 2.3 ±1.5 and 42% of the children were female. Majority of the children had elevated heart rate and tachypnea at the time of admission. As can be seen from **Table 1** the lymphocyte counts were slightly reduced in the study population.

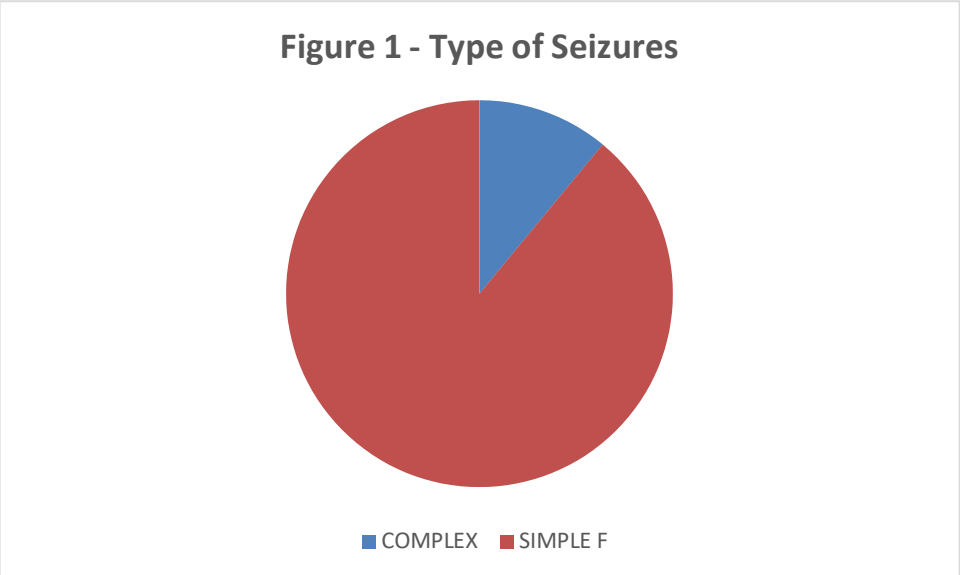
Table 1: Baseline characteristics

	N	**Mean**	**Std. Deviation**
Age	90	2.34	1.58
Temperature	89	100.28	0.89
Heart rate	90	107.92	19.87
Respiratory rate	89	30.83	7.52
Total wbc count	91	12659	6848
Neutrophils	91	8607	5398
Lymphocytes	91	3304	2339
Neutrophil - lymphocyte ratio (NLR)	91	3.86	3.35
Platelet count	91	334439	115118
Platelet - lymphocyte ratio (PLR)	91	152.34	106.02
TIBC	26	759.69	150.02

As shown in **Table 2,** 89% of the children had simple febrile seizures and remaining (11%) being complex febrile seizures.

Table 2 : Type of Febrile Seizure

COMPLEX		SIMPLE F	
Count	N %	Count	N %
10	11.0%	81	89.0%



The occurrence of family history of seizure was rare in both simple and complex febrile groups. Around 13% of study population had past history of febrile seizures.

60% of children in the simple febrile seizure had elevated CRP levels compared to 80% of the children in the complex febrile seizure type **(Table 3)**.

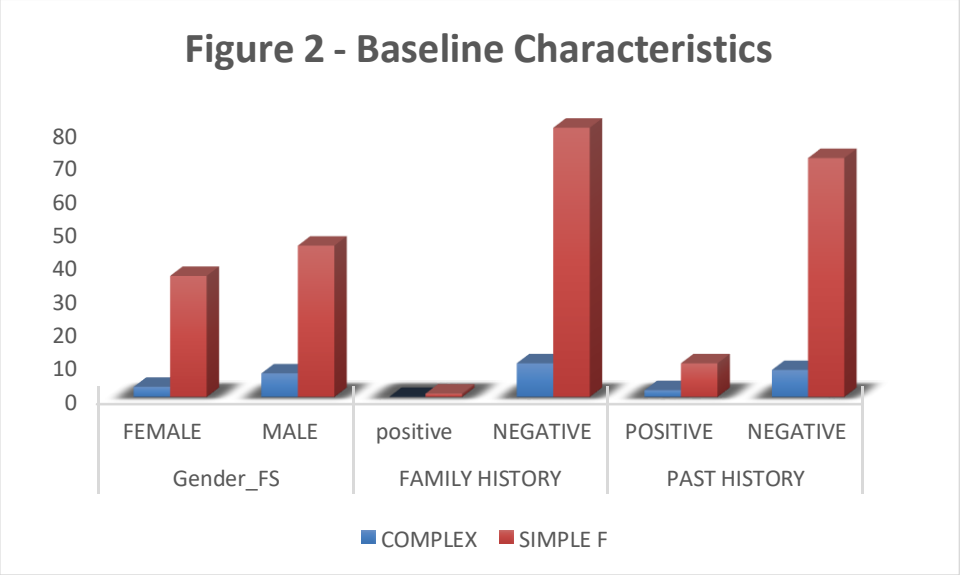


TABLE 3 – Baseline Characteristics

		TypeofFebrileSeizure		Total
		COMPLEX	SIMPLE F	
Gender_FS	FEMALE	3	36	39
	MALE	7	45	52
FAMILY HISTORY	H/O SEIZURE DISORDER IN SIBLING	0	1	1
	NOT SIGNIFICANT	10	80	90
PAST HISTORY	K/C/O FEBRILE SEIZURES	2	10	12
	NOT SIGNIFICANT	8	71	79
CRP Qualitative	Negative	2	32	34
	Positive	8	49	57

Table 4: Length of Hospital Stay

	N	Mean	Std. Deviation
	91	2.956	0.7733
DURATION OF HOSPITAL STAY	91	5.681	0.8804

The average number of PICU stay in the study population was 3 days and the mean duration of hospital stay was 5 days. **(Table 4)**

There was no significant difference between the simple and complex febrile seizure types with regard to age, temperature, heart rate and respiratory rate (**Table 5**).

Table 5: Comparison of clinical characteristics between Simple and Complex Febrile Seizure groups

	Type of FebrileSeizure					
	COMPLEX		SIMPLE		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
AGE	2.51	0.925	2.32	1.643	2.34	1.577
TEMPERATURE	100.420	0.8664	100.263	0.8945	100.281	0.8879
HEART RATE	111.00	19.328	107.54	20.023	107.92	19.870
RESPIRATORY RATE	32.50	8.631	30.62	7.399	30.83	7.517

The haematological parameters are presented for both the seizure types in **Table 6**. The counts did not differ between the simple and complex febrile seizure types. There was a trend toward towards lymphopenia in both the groups.

Table 6 : Comparison of Haematological parameters between the two groups

	COMPLEX FS		SIMPLE FS		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
TOTAL WBC COUNT	11074.0	6827.90	12855	6867.90	12659.5	6848.6
NEUTROPHILS	7713.1	5200.24	8717	5443.89	8607.1	5398.8
LYMPHOCYTES	2857.8	2858.31	3359	2282.14	3304.1	2339.1
NEUTROPHIL - LYMPHOCYTE RATIO (NLR)	3.7	2.03	3.8748	3.49	3.9	3.4
PLATELET COUNT	321200.0	89840.35	336074	118220.32	334439.6	115118.0
PLATELET - LYMPHOCYTE RATIO (PLR)	177.3	98.02	149.2589	107.13	152.3	106.0
CRP Quantitative	26.5	15.24	30.20	28.94	29.7	27.5
RED CELL DISTRIBUTION WIDTH (RDW)	15.7	2.65	18.183	18.88	17.9	17.8

Table 7 : Comparison of duration of hospital stay between Simple and Complex Febrile Seizure group

	COMPLEX FS		SIMPLE FS		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
DURATION OF PICU STAY	3.000	.6667	2.951	0.7890	2.956	0.7733
DURATION OF HOSPITAL STAY*	5.700	.8233	5.679	0.8920	5.681	0.8804

P< 0.05

There was significant difference with regard to duration of hospital stay between the two groups as shown in **Table 7 .**

Table 8 shows the number of prolonged hospitalisation in simple febrile seizure group as compared to complex febrile seizure group.

Table 8: Type of Febrile Seizure and Prolongation hospital stay

		Prolongation_hospital_stay		Total
		Prolongation of hospital stay	No prolongation of hospital stay	
TypeofFebrileSeizure	COMPLEX	5	5	10
	SIMPLE F	37	44	81
Total		42	49	91

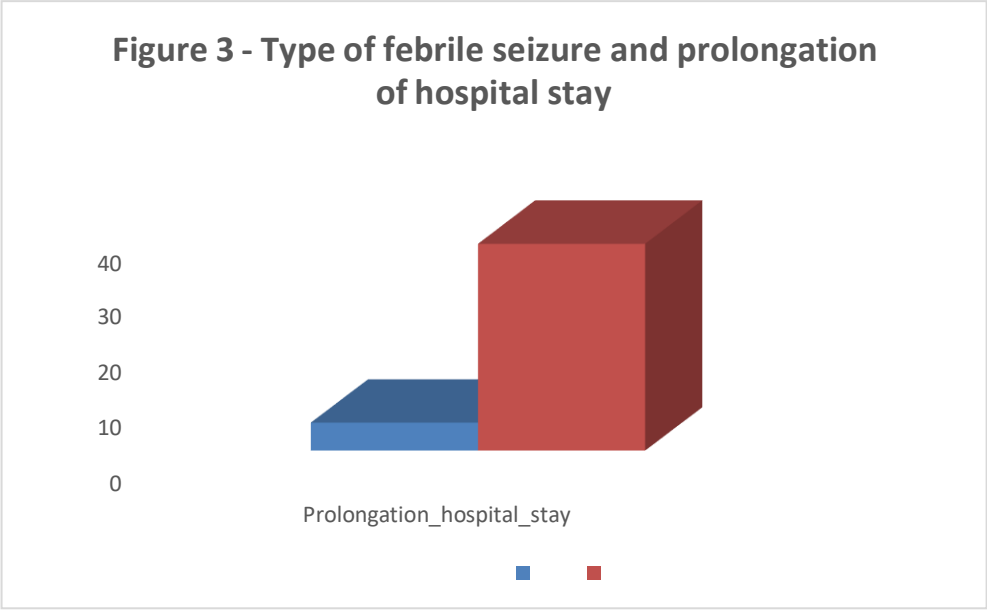
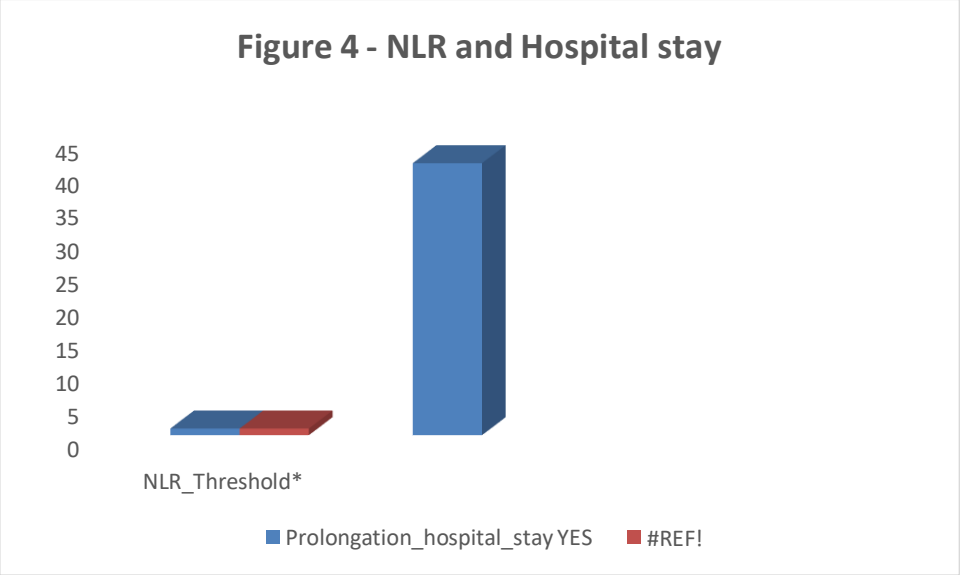


Table 9: NLR levels elevated and Prolongation hospital stay

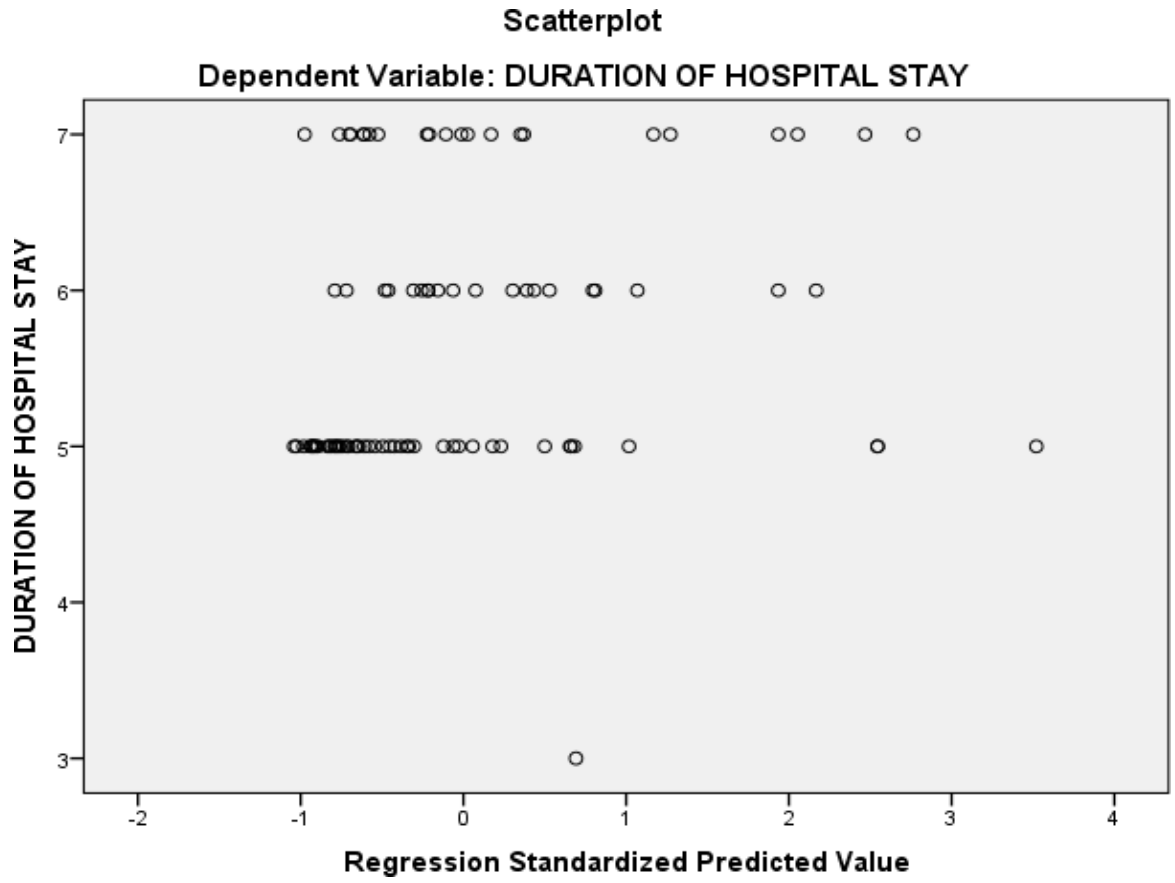
		Prolongation_hospital_stay		Total
		Prolongation of hospital stay	No prolongation of hospital stay	
NLR_Threshold*	low	1	13	14
	high	41	36	77
Total		42	49	91

*** p=0.001**



Considering NLR of 1.13 as a cut off and high NLR, there was a strong association between high NLR and prolongationof hospital stay **(Table 9) [p=0.001]** implying higher the NLR higher the risk of prolongation of hospital stay. The association between NLR and length of hospitalization is shown as a scatter plot in **Figure 5**.

Figure 5: Scatter plot of Neutrophil Lymphocyte Ratio and Duration of Hospital stay



NLR as a predictor of type of seizure

The NLR AUC for predicting type of seizure is 0.56 and width of the Confidence limits are wide (95% CI- 0.38 to 0.75) implying poor predictive ability. A look on coordinates from **Figure 6 & Table 10** shows that a cut off 3.39 and above has **60% sensitivity and 71% specificity** in predicting type of febrile seizure in children presenting with febrile seizures.

Figure 6 : NLR and type of seizure

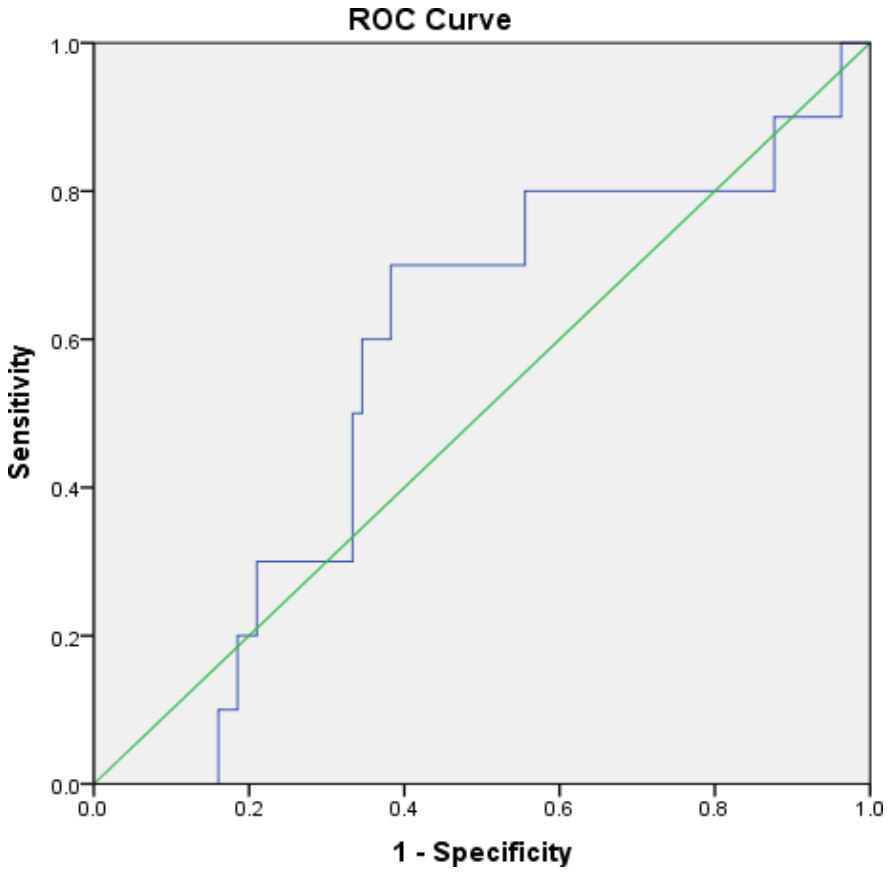


Table 10 : Area Under the Curve NLR – type of Seizure

Test Result Variable (s):	NEUTROPHIL - LYMPHOCYTE RATIO (NLR)			
Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.565	.092	0.501	0.385	0.746

PLR as predictive marker for type of seizure

The PLR AUC for predicting type of seizure is 0.6 and width of the Confidence limits are wide implying poor predictive ability. A look on coordinates from **Figure 7 & Table 11** shows that a cut off 171 and above has **60% sensitivity and 71% specificity** in predicting type of febrile seizure in children presenting with febrile seizures.

Figure 7: ROC Platelet Lymphocyte Ratio and Type of Seizure

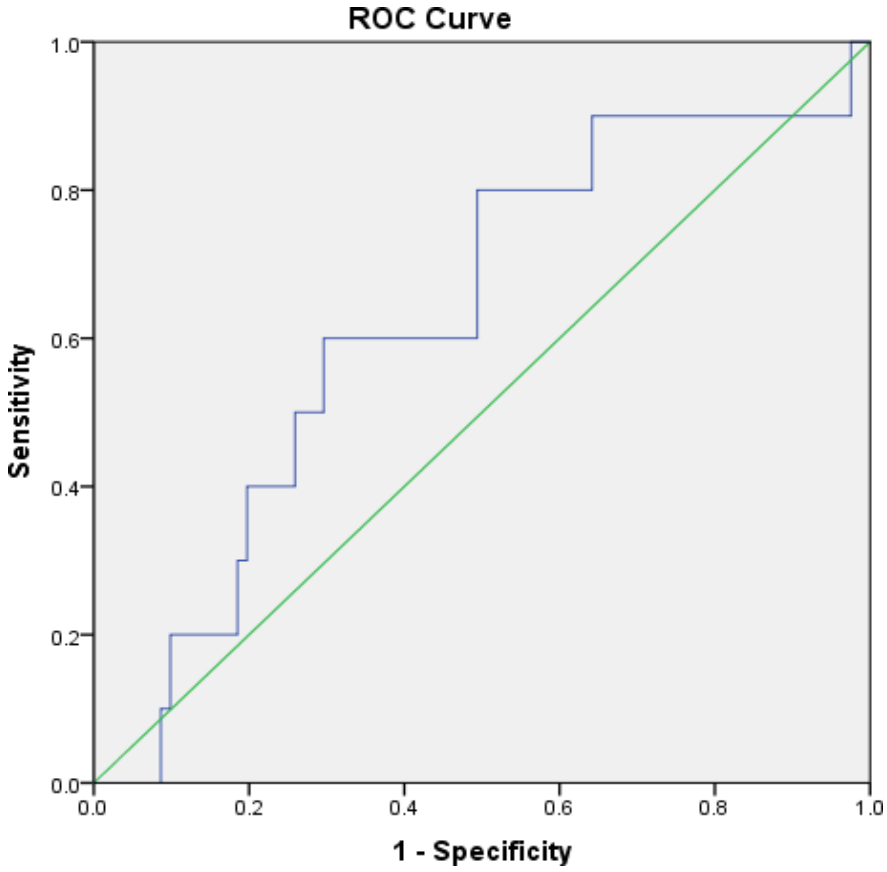


Table 11 – AUC PLR and Type of seizure

Test Result. Variable (s):	**PLATELET. - LYMPHOCYTE RATIO (PLR)**			
Area	**Std. Error[a]**	**Asymptotic Sig.[b]**	**Asymptotic 95% Confidence Interval**	
			Lower Bound	**Upper Bound**
0.627	**0.091**	**0.191**	**0.449**	**0.805**
a. Under the nonparametric assumption				
b. Null hypothesis: true area = 0.5				

Red cell Distribution Width as predictor of type of seizure

The RDW AUC for predicting type of seizure is 0.5 and width of the Confidence limits are wide (95% CI- 0.3 to 0.7) implying poor predictive ability. A look on coordinates from **Figure 8 & Table 12** shows that a cut off 14.5 and above has **60% sensitivity and 46% specificity** in predicting type of febrile seizure in children presenting with febrile seizures.

Figure 8 – RDW and type of Seizure

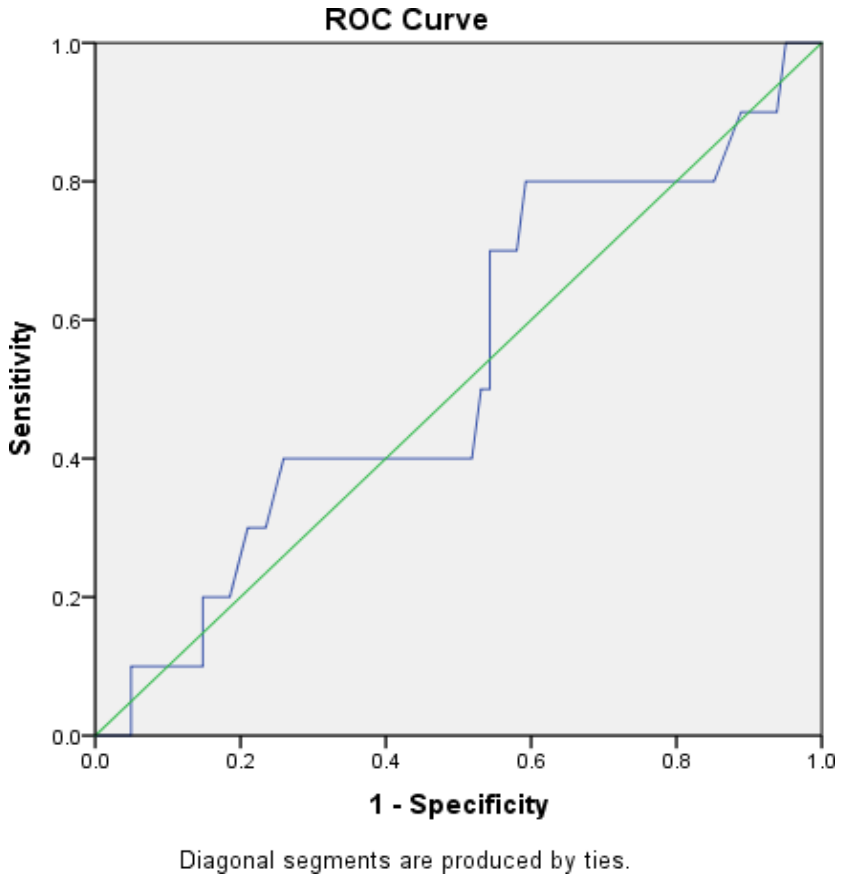


Table 12 – RDW and type of seizure type

Test Result Variable(s):	RED CELL DISTRIBUTION WIDTH (RDW)			
Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.535	0.097	0.722	0.345	0.724

CRP Quantitative as predictor of type of seizure

The CRP AUC for predicting type of seizure is 0.5 and width of the Confidence limits are wide (95% CI- 0.3 to 0.7) implying poor predictive ability. A look on coordinates from **Figure 9 & Table 13** shows that a cut off 18.45 and above has **66% sensitivity and 50% specificity** in predicting type of febrile seizure in children presenting with febrile seizures.

Figure 9 : CRP Quantitative & Type of Seizure

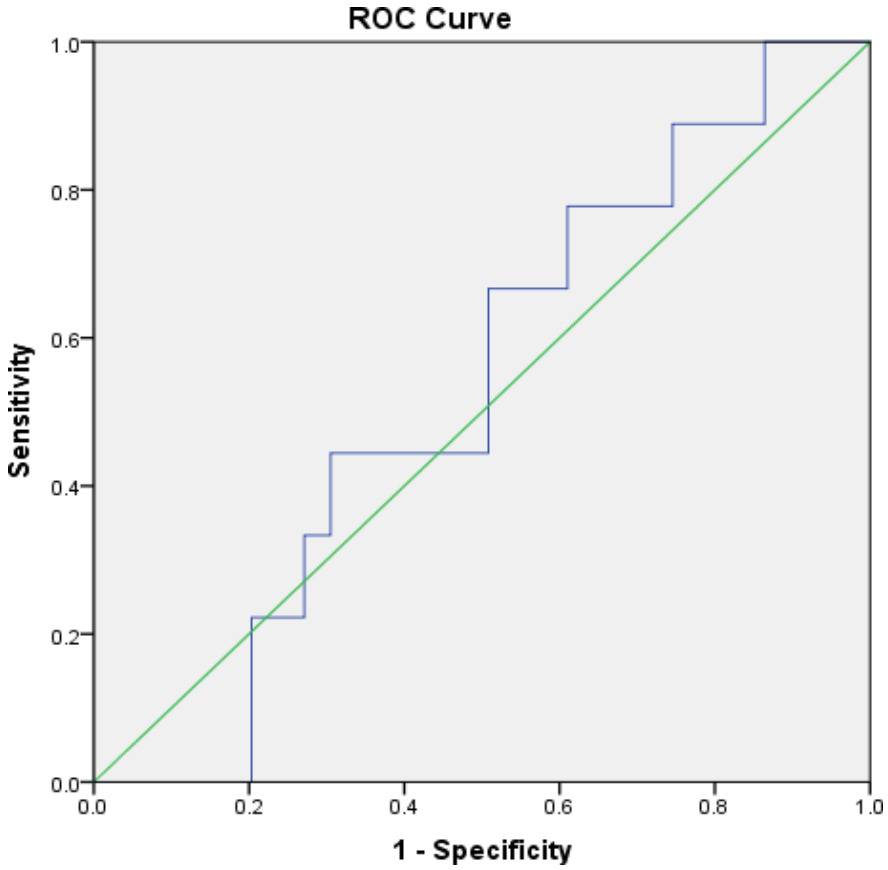
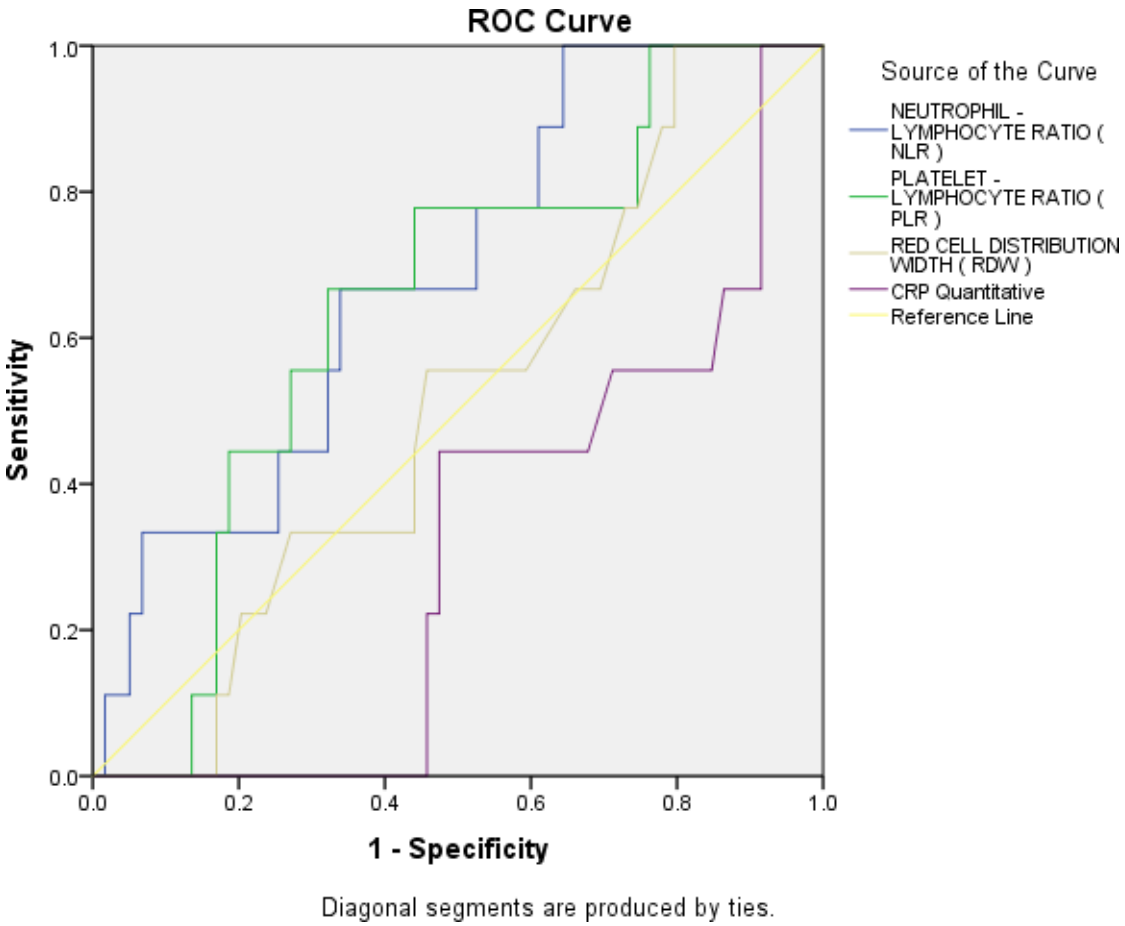


Table 13 : CRP Quantitative & AUC

Test Result Variable(s):	**CRP Quantitative**			
Area	**Std. Error[a]**	**Asymptotic Sig.[b]**	**Asymptotic 95% Confidence Interval**	
			Lower Bound	**Upper Bound**
0.531	**0.089**	**0.765**	**0.357**	**0.706**

Figure 10: Summary of ROC curves for various parameters



Correlation of Neutrophil Lymphocyte Ration and Duration of Hospital Stay

Testing for correlation between NLR values of and duration of hospitalization shows a

Positive correlation (p=0.04 for Hospital stay, p=0.001 for duration of PICU stay)

Figure 11: Correlation testing between NLR and Duration of hospital stay

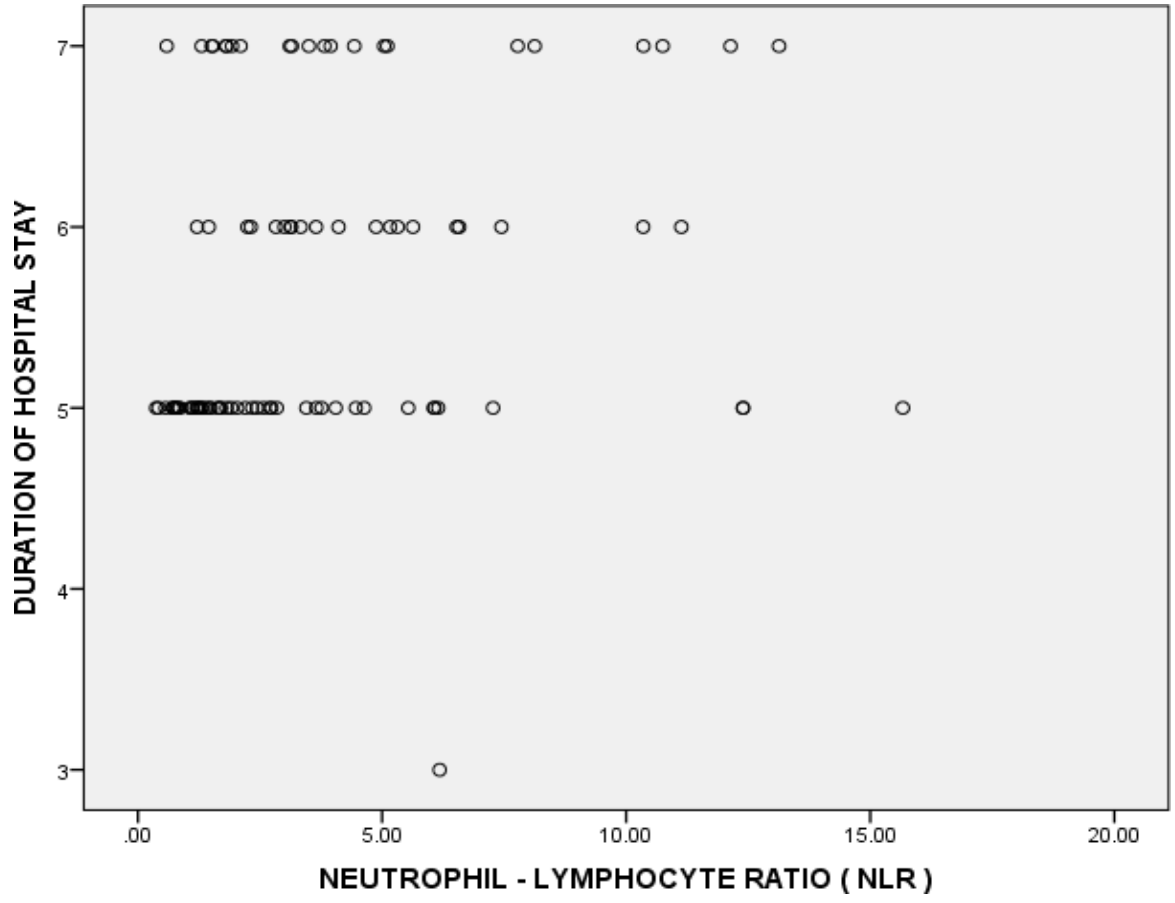
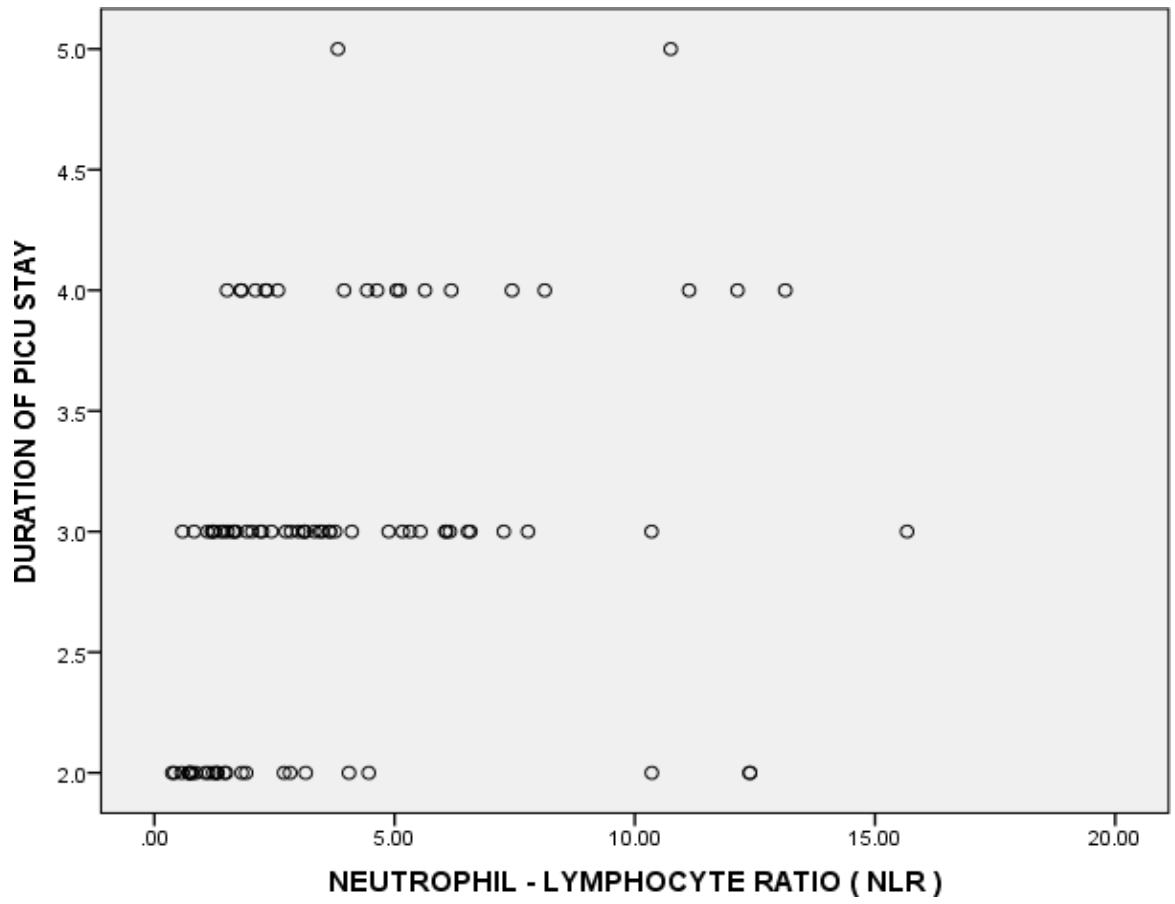


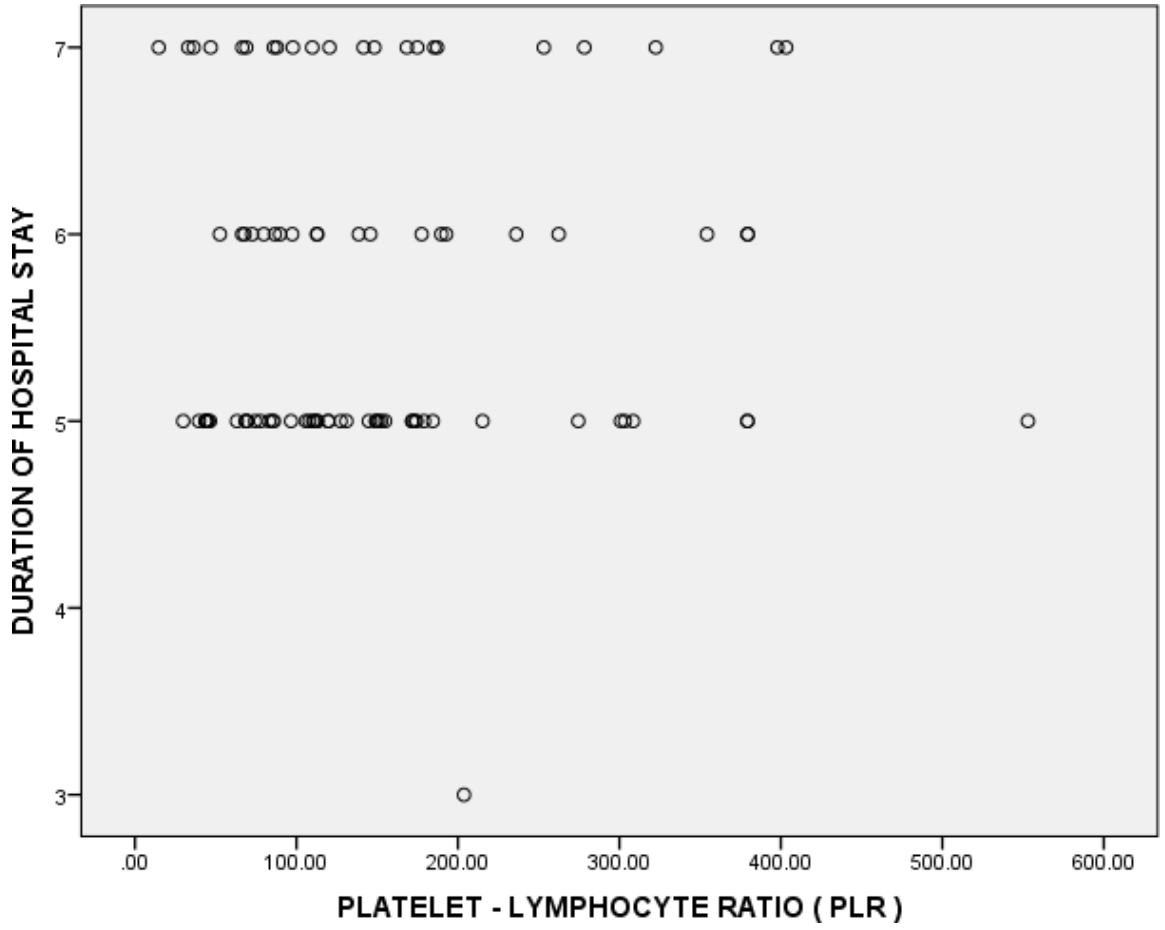
Figure 12: Correlation testing between NLR and Duration of PICU stay



Correlation of PLR and Duration of Hospital Stay

When comparing PLR and Duration of Hospital stay there was no significant correlation between the two as shown in **Figure 13**.

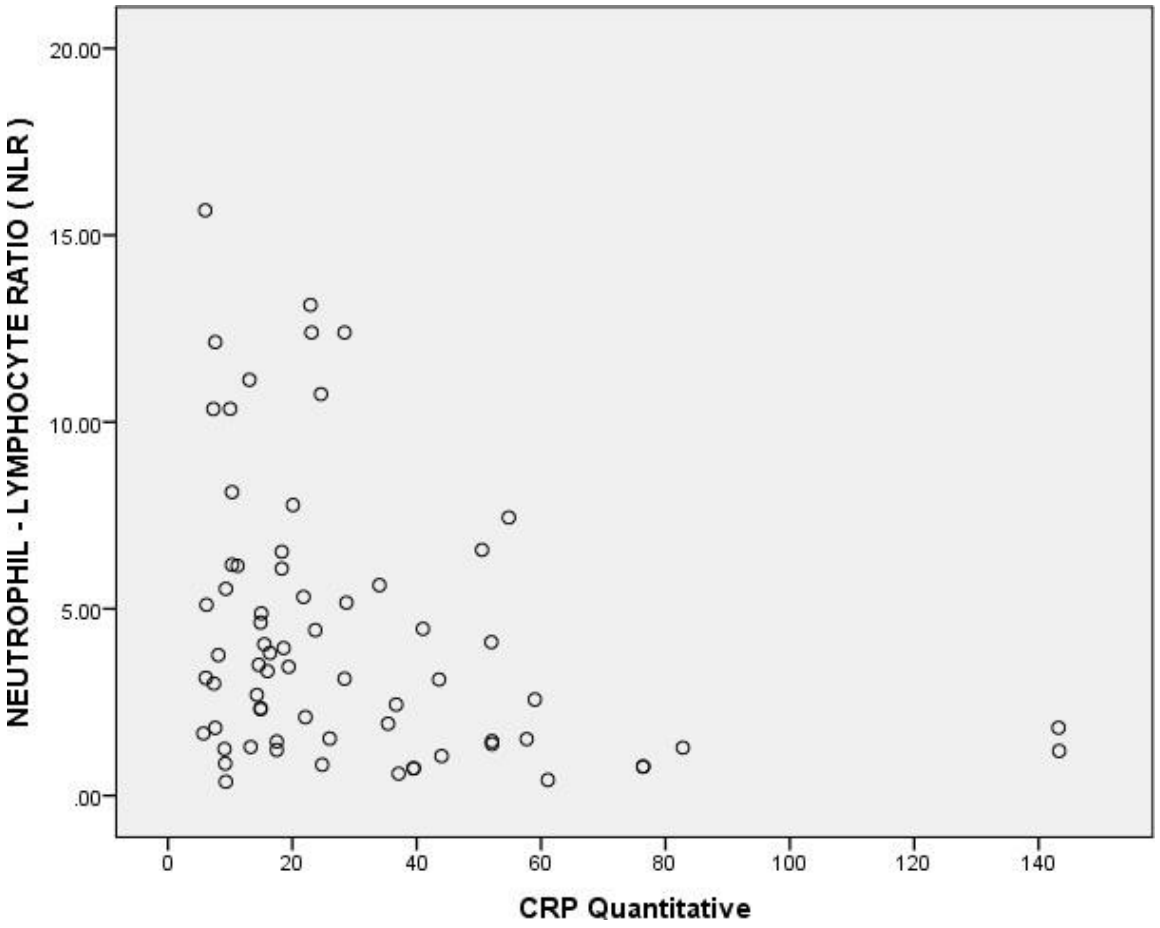
Figure 13: Scatterplot examining the correlation between PLR and Duration of Hospital Stay



Correlation between NLR and CRP levels

Figure 14 examines the correlation between NLR and CRP levels in the form of a scatter plot. There was a significant correlation between NLR and the levels of CRP (correlation coefficient =0.3) and p = 0.009. As the levels of CRP increase the NLR also increases.

Figure 14 : Correlation between CRP levels and NLR



Factors associated with Seizure Recurrence

Comparing the levels of NLR of those who had episode/episodes of seizure recurrence with those who did not have recurrence revealed no significant difference between the two groups (mean NLR 2.5 vs 4.2, **Table 14**). In comparison to the non-recurrent group, the PLR values of the recurrent group were much lower. (94.2 vs 166.4, **Table 15**). However there were no other significant differences between the haematological parameters between the recurrent group as compared to non recurrent group.

Table 14 : Levels of NLR and Seizure recurrence

	NEUTROPHIL - LYMPHOCYTE RATIO (NLR)		**P value**
	Follow Up Seizure		
	Seizure Recurrence	No seizure recurrence	
N	17	58	0.439
Mean	2.49	4.33	
Std. Deviation	2.77	3.55	

Table 15: Levels of PLR and Seizure recurrence

	PLATELET - LYMPHOCYTE RATIO (PLR)		P value
	Follow Up Seizure		
	Seizure Recurrence	No seizure recurrence	
N	17	58	**p=0.02***
Mean	94.25	166.38	
Std. Deviation	68.14	116.57	

PLR and seizure recurrence

The PLR AUC for predicting seizure recurrence is 7.1 and width of the Confidence limits are (95% CI- 0.58 to 0.83) implying good predictive ability. A look on coordinates from **Figure 15 & Table 16** shows that a cut off 111 and below has **70% sensitivity and 61% specificity** in predicting seizure recurrence in children presenting with febrile seizures.

Table 16: Area under the curve PLR- seizure recurrence

Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.711	0.065	0.008	0.583	0.839

Figure 15: ROC - PLR & Seizure recurrence

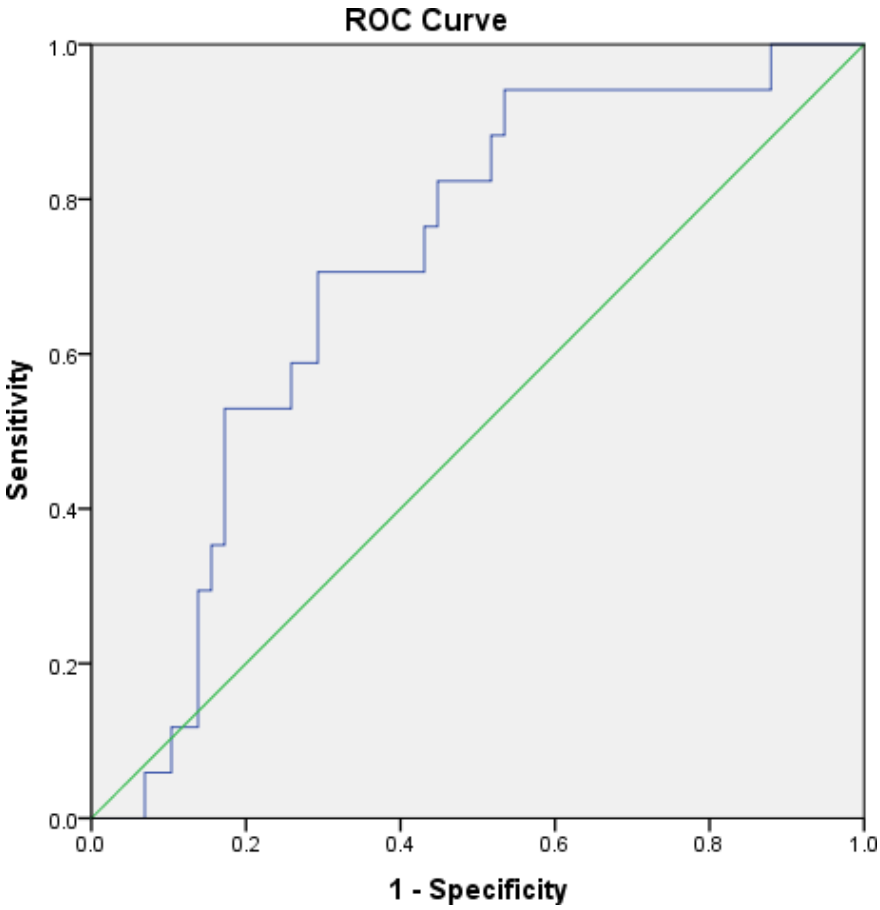


Table 17: Haematological Parameters and Seizure recurrence

	Seizure Recurrence			No seizure recurrence			Total		
	Mean	N	Std. Deviation	Mean	N	Std. Deviation	Mean	N	Std. Deviation
TOTAL COUNT	12590	17	7243	12506	58	6538	12525	75	6653
NEUTROPHILS	12367	17	20856	8668	58	5190	9507	75	10827
LYMPHOCYTES	3889	17	2212	2996	58	2213	3198	75	2230
PLATELET COUNT	287500	12	110711	328273	44	118874	319536	56	117406

DISCUSSION

The present study evaluated the role of NLR in predicting the length of hospital stay. The average NLR in our study sample of febrile children was 3.86 ± 3.5. This is higher compared to studies conducted by Goksugur et al. Similary the average PLR 152.34 ± 106 and the RDW 17.9 ± 17.

NLR and length of hospital stay

This is the first of its kind study looking at the NLR levels at admission and its association with length of stay in the PICU and the hospital. For length of hospital stay there was a significant correlation of +0.3 meaning higher the NLR the longer the duration of hospital stay by one day. Similary for PICU stay the higher the NLR longer the length. The study points that the higher NLR can predict the length of hospitalization in children with febrile seizures

In the same way higher PLR can predict the period of PICU stay thogh it was not as effective as NLR in predicting the hospital stay.

NLR - predicting the type of seizure

The numbers of NLR seen in our study are higher when compared numbers reported in healthy controls and febrile controls. In their study Goksugur et al there was a substantial difference in the reported NLRs in the SFS and CFS groups, which were 2.18 ± 1.9 and 3.8 ± 4.2, respectively. However no such difference was seen in our study. The possible explanation is NLR can be increased in all cases of febrile seizures irrespective of the seizure type.

They found that with a cut-off point 1.98 for NLR the sensitivity and specificity were 66.7% and 60.3% respectively for differentiating SFS and CFS. In our study we found that a cut off of 3.39 with 60% sensitivity and 71 % specificity. The mean serum RDW was 16.1 ± 1.1 and 16.6 ± 0.8 in the SFS and CFS groups, respectively, and there was a significant difference between the two. The

sensitivity and specificity reported for RDW in our study are similar to the one reported in the above study.

The high NLR observed in our study is similar to the one reported by Li et al investigating the importance of NLR, MPV, Platelets count, MPR (MPV/Platelet count ratio) and RDW in febrile children with seizure and children without seizures. In this study, complex febrile seizures (CFS) compared to simple febrile seizures (SFS) had lower mean MPV levels and higher mean NLR levels, (3.2 vs 1.6) and the diferences were statistically signifcant. The best cut-off value for NLR, according to analysis receiver operating characteristics, was 2.549, with a 65.9% sensitivity and a 57.5% specificity, which is consistent with the findings of our study.

We did not observe a significant difference between the average NLR values for SFS and CFS groups, in contrast to Yigit et al's study, however the cutoff value was 3.39 as opposed to 2.315 in their study.The sensitivity and specificity of 62.7% and 53.8%, respectively are similar to the one reported in our study. The AUC obtained for various parameters were on the lower side with wide confidence interval.

CRP and type of seizure

The mean C-reactive protein level in the study group was 29.73 mg/L which is higher compared to the mean CRP levels reported in a study by Romanowska et al[33]. However in contrast to their study we did not find a statistically significant difference between the groups in the number of lymphocytes and neutrophils. The preductive cut off for NLR proposed by various studies varies from 1.98 -2.315[10,34]. Our study reports a cut off 3.39 which is slightly higher. NLR and RDW cannot effectively differentiate SFS and CFS, according to Kubota et al. in their study of 205 children looking at the impact of inflammatory markers in classification of febrile seizures[35]. These studies support the view the role of NLR needs to be explored further in febrile seizures.

They conducted a comprehensive review to ascertain the association between febrile seizures and neutrophil to lymphocyte ratio (NLR). NLR levels were considerably greater in FS patients compared to the febrile control group, according to 17 studies included by Hosseini et al. Additionally, they discovered that patients with complex FS had considerably greater NLR levels than those with simple FS.

RDW and type of seizure

Similar to a study by Liu et al we did not find a significant difference in RDW values between the groups. Buttarello et al. found a bias between the median RDW values in reference range of 1%–24% in their research of 220 healthy participants.[36] Independent studies have demonstrated that RDW readings from Sysmex, Mindray, and Beckman Coulter hemocytometers are consistent with one another and greater than readings from Siemens devices; readings from Abbott brand devices being the lowest of all devices.[37] There needs to be more uniformity among manufacturers when it comes to RDW measurements, despite the International Council for Standardization in Haematology's recommendations from roughly 25 years ago for standardisation in the measurement of RBC distribution curves.

Platelet derived parameters as prognostic markers:

The predictive ability of Platelet Lymphocyte Ratio (PLR) to differentiate the type of seizure was low. The inflammatory response of systemic onset during the active phase of the illness was reflected in a study by Tang et al., finding that PLR readings of the FS and FC groups were more than that of the control group. However, significant differences between the SFS and CFS groups were nil.[41] Additionally, they noted a significant difference in PLR values between the groups with and without recurrence. The PLR values of the recurrent group were significantly lower than those of the non-recurrent group because the platelet count of the recurrent group was much less than the non-recurrent group. In a study conducted by Mathew S et al., decreasing PLR was associated with better

survival among children admitted to pediatric intensive care unit.[42] Thus PLR can be used as a simple marker of the severity of the inflammation as well as prognosis.[43]

When we looked at the correlation between NLR and CRP levels there was a significant correlation. Our study has shown that NLR, PLR, RDW did not differentiate between the seizure type. NLR influences the length of the hospital stay while PLR RDW did not.

Seizure Recurrence and haematological parameters

The children were followed up for 6 months and the data with regard to recurrence of seizure episode was collected. We found no significant difference in the levels of NLR between the recurrent and non recurrent group. However the levels of **PLR** were significantly lower in those children who had recurrence compared to those who did not.This may be attributed to decreased platelet count of the recurrent group. These outcomes are identical to those of a study by Tang et al., which discovered a significant difference in PLR levels between the group with recurrent and non-recurrent seizures.[41]

Strengths

There are no studies from India looking at the NLR as a predictor of length of hospital stay. There are limited studies from India evaluating the role of NLR, PLR in febrile seizures and their influence on the length of hospital stay[13].

Few prospective studies with patient follow-up after the initial episode of febrile seizures have been conducted in the Indian population to determine the factors influencing recurrence and its relationship to future epilepsy.[18]

The other studies which have looked at the length of hospital stay are in specific conditions like Viral Encephalitis. The simplicity of the test and ease of doing can aid in the expecting the prolongation of hospital stay. Higher NLR can aid in the identifying high risk children and optimization of hospital resources.

SUMMARY

- A total of 91 children who had presented with febrile seizures were recruited in the study. The average age of the study population was 2.3 ±1.5 and 42% of the children were female.
- 89% of the children had simple febrile seizures and remaining 11% being complex febrile seizures.
- Around 13% of study population had past history of febrile seizures.
- 60% of children in the simple febrile seizure had elevated CRP levels compared to 80% of the children in the complex febrile seizure type
- Considering NLR of 1.13 as a cut off and high NLR, there was a strong association between high NLR and prolongationof hospital stay **[p=0.001]** implying higher the NLR higher the risk of prolongation of hospital stay.
- NLR has poor predictive ability to predict type of seizure as well as seizure recurrence.
- Low PLR value implies good predictive ability for seizure recurrence.

CONCLUSION

In a study of 91 children with febrile seizure the mean age was 2 years 3 months and 43% were female. Simple febrile seizures were seen in 89% of the children while complex febrile seizures accounted for the remaining. High Neutrophil Lymphocyte Ratios were associated with longer duration of hospitalization. NLR can help in prognosticating high risk children for providing appropriate care. High NLR levels were are also associated with prolonged PICU stay. NLR as a marker can help in optimizing the care of children with febrile seizures. During the six month follow up period seizure recurrence was seen in 22% of the children. The levels of Platelet Lymphocyte Ratio were significantly lower in those children who had recurrence compared to those who did not. A low PLR can be used as a predictor of seizure recurrence.

LIMITATIONS

The levels of various markers in Non seizure febrile controls and Healthy controls have not been evaluated in the present study. We understand that length of hospital stay would depend on several other factors but we have a followed uniform discharge criteria in our study.

RECOMMENDATIONS

Data from developing countries are limited with respect to predictive role of haematological parameters in febrile seizures. Further studies could look at the levels of NLR, PLR and the risk of complications.

BIBILOGRAPHY

1. Expert Committee on Pediatric Epilepsy, Indian Academy of Pediatrics. Guidelines for diagnosis and management of childhood epilepsy. Indian Pediatr. 2009 Aug;46(8):681–98.

2. Leung AK, Hon KL, Leung TN. Febrile seizures: an overview. Drugs Context. 2018;7:212536.

3. Hauser WA. The prevalence and incidence of convulsive disorders in children. Epilepsia. 1994;35 Suppl 2:S1-6.

4. Patterson JL, Carapetian SA, Hageman JR, Kelley KR. Febrile seizures. Pediatr Ann. 2013 Dec;42(12):249–54.

5. Waruiru C, Appleton R. Febrile seizures: an update. Arch Dis Child. 2004 Aug;89(8):751–6.

6. Subcommittee on Febrile Seizures, American Academy of Pediatrics. Neurodiagnostic evaluation of the child with a simple febrile seizure. Pediatrics. 2011 Feb;127(2):389–94.

7. NIH Consensus Development Conference summary. Febrile seizures--long-term management of children with fever associated seizures. J Tenn Med Assoc. 1981 Jan;74(1):62–5.

8. Choi J, Min HJ, Shin JS. Increased levels of HMGB1 and pro-inflammatory cytokines in children with febrile seizures. J Neuroinflammation. 2011 Oct 11;8:135.

9. Templeton AJ, McNamara MG, Šeruga B, Vera-Badillo FE, Aneja P, Ocaña A, et al. Prognostic role of neutrophil-to-lymphocyte ratio in solid tumors: a systematic review and meta-analysis. J Natl Cancer Inst. 2014 Jun;106(6):dju124.

10. Goksugur SB, Kabakus N, Bekdas M, Demircioglu F. Neutrophil-to-lymphocyte ratio and red blood cell distribution width is a practical predictor for differentiation of febrile seizure types. Eur Rev Med Pharmacol Sci. 2014 Nov;18(22):3380–5.

11. Förhécz Z, Gombos T, Borgulya G, Pozsonyi Z, Prohászka Z, Jánoskuti L. Red cell distribution width in heart failure: prediction of clinical events and relationship with markers of ineffective erythropoiesis, inflammation, renal function, and nutritional state. Am Heart J. 2009 Oct;158(4):659–66.

12. Hu Z, Sun Y, Wang Q, Han Z, Huang Y, Liu X, et al. Red blood cell distribution width is a potential prognostic index for liver disease. Clin Chem Lab Med. 2013 Jul;51(7):1403–8.

13. Tripathy SK, Mishra P, Dwibedi B, Priyadarshini L, Das RR. Clinico-epidemiological Study of Viral Acute Encephalitis Syndrome Cases and Comparison to Nonviral Cases in Children from Eastern India. J Glob Infect Dis. 2019 Mar;11(1):7–12.

14. Guidelines for epidemiologic studies on epilepsy. Commission on Epidemiology and Prognosis, International League Against Epilepsy. Epilepsia. 1993 Aug;34(4):592–6.

15. Verity CM, Butler NR, Golding J. Febrile convulsions in a national cohort followed up from birth. I--Prevalence and recurrence in the first five years of life. Br Med J Clin Res Ed. 1985 May 4;290(6478):1307–10.

16. Hackett R, Hackett L, Bhakta P. Febrile seizures in a south Indian district: incidence and associations. Dev Med Child Neurol. 1997 Jun;39(6):380–4.

17. Patel N, Ram D, Swiderska N, Mewasingh LD, Newton RW, Offringa M. Febrile seizures. BMJ. 2015 Aug 18;351:h4240.

18. Shankar P, Mahamud S. Clinical, epidemiological and laboratory characteristics of children with febrile seizures. Int J Contemp Pediatr. 2020 Jun 24;7(7):1598–605.

19. Sharawat IK, Singh J, Dawman L, Singh A. Evaluation of Risk Factors Associated with First Episode Febrile Seizure. J Clin Diagn Res JCDR. 2016 May;10(5):SC10-13.

20. Mittal R. Recent advances in febrile seizures. Indian J Pediatr. 2014 Sep;81(9):909–16.

21. Vestergaard M, Pedersen MG, Ostergaard JR, Pedersen CB, Olsen J, Christensen J. Death in children with febrile seizures: a population-based cohort study. Lancet Lond Engl. 2008 Aug 9;372(9637):457–63.

22. Berg AT, Shinnar S, Darefsky AS, Holford TR, Shapiro ED, Salomon ME, et al. Predictors of recurrent febrile seizures. A prospective cohort study. Arch Pediatr Adolesc Med. 1997 Apr;151(4):371–8.

23. Berg AT, Shinnar S, Hauser WA, Alemany M, Shapiro ED, Salomon ME, et al. A prospective study of recurrent febrile seizures. N Engl J Med. 1992 Oct 15;327(16):1122–7.

24. Berg AT. Are febrile seizures provoked by a rapid rise in temperature? Am J Dis Child 1960. 1993 Oct;147(10):1101–3.

25. Minchom PE, Wallace SJ. Febrile convulsions: electroencephalographic changes related to rectal temperature. Arch Dis Child. 1984 Apr;59(4):371–3.

26. Choy M, Dubé CM, Ehrengruber M, Baram TZ. Inflammatory processes, febrile seizures, and subsequent epileptogenesis. Epilepsy Curr. 2014 Jan;14(1 Suppl):15–22.

27. Dubé CM, Brewster AL, Baram TZ. Febrile seizures: mechanisms and relationship to epilepsy. Brain Dev. 2009 May;31(5):366–71.

28. Dubé C, Vezzani A, Behrens M, Bartfai T, Baram TZ. Interleukin-1beta contributes to the generation of experimental febrile seizures. Ann Neurol. 2005 Jan;57(1):152–5.

29. Delpisheh A, Veisani Y, Sayehmiri K, Fayyazi A. Febrile seizures: etiology, prevalence, and geographical variation. Iran J Child Neurol. 2014;8(3):30–7.

30. Biyik M, Ucar R, Solak Y, Gungor G, Polat I, Gaipov A, et al. Blood neutrophil-to-lymphocyte ratio independently predicts survival in patients with liver cirrhosis. Eur J Gastroenterol Hepatol. 2013 Apr;25(4):435–41.

31. J L, Y L, P X, L P, H X, C L, et al. Neutrophil-to-lymphocyte ratio predicts critical illness patients with 2019 coronavirus disease in the early stage. J Transl Med [Internet]. 2020 May 20 [cited 2022 Feb 10];18(1). Available from: https://pubmed.ncbi.nlm.nih.gov/32434518/

32. Liu Z, Li X, Zhang M, Huang X, Bai J, Pan Z, et al. The role of Mean Platelet Volume/platelet count Ratio and Neutrophil to Lymphocyte Ratio on the risk of Febrile Seizure. Sci Rep. 2018 Oct 11;8:15123.

33. Gontko – Romanowska K, Żaba Z, Panieński P, Steinborn B, Szemień M, Łukasik – Głębocka M, et al. The assessment of laboratory parameters in children with fever and febrile seizures. Brain Behav. 2017;7(7):e00720.

34. Yigit Y, Yilmaz S, Akdogan A, Halhalli HC, Ozbek AE, Gencer EG. The role of neutrophil-lymphocyte ratio and red blood cell distribution width in the classification of febrile seizures. Eur Rev Med Pharmacol Sci. 2017 Feb;21(3):554–9.

35. Kubota J, Hirano D, Suzuki T, Kakegawa D, Ito A. The role of inflammatory markers and calculated osmotic pressure in the classification of febrile seizures. Eur Rev Med Pharmacol Sci. 2020 Nov;24(21):11187–91.

36. Buttarello M, Plebani M. Automated blood cell counts: state of the art. Am J Clin Pathol. 2008 Jul;130(1):104–16.

37. Lippi G, Pavesi F, Bardi M, Pipitone S. Lack of harmonization of red blood cell distribution width (RDW). Evaluation of four hematological analyzers. Clin Biochem. 2014 Aug;47(12):1100–3.

38. Kartal Ö, Kartal AT. Can we trust RDW for differentiation of febrile seizure types? Eur Rev Med Pharmacol Sci. 2015;19(3):345–6.

39. Kisacik B, Tufan A, Kalyoncu U, Karadag O, Akdogan A, Ozturk MA, et al. Mean platelet volume (MPV) as an inflammatory marker in ankylosing spondylitis and rheumatoid arthritis. Joint Bone Spine. 2008 May;75(3):291–4.

40. Ponomarev ED. Fresh Evidence for Platelets as Neuronal and Innate Immune Cells: Their Role in the Activation, Differentiation, and Deactivation of Th1, Th17, and Tregs during Tissue Inflammation. Front Immunol. 2018;9:406.

41. Tang L, Chen JR. The Predictive Value of Hemocytometry Based on Peripheral Platelet-Related Parameters in Identifying the Causes of Febrile Seizures. J Inflamm Res. 2021;14:5381–92.

42. Mathews S, Rajan A, Soans ST. Prognostic value of rise in neutrophil to lymphocyte ratio (NLR) and platelet to lymphocyte ratio (PLR) in predicting the mortality in paediatric intensive care. Int J Contemp Pediatr. 2019 Apr 30;6(3):1052.

43. Stojkovic Lalosevic M, Pavlovic Markovic A, Stankovic S, Stojkovic M, Dimitrijevic I, Radoman Vujacic I, et al. Combined Diagnostic Efficacy of Neutrophil-to-Lymphocyte Ratio (NLR), Platelet-to-Lymphocyte Ratio (PLR), and Mean Platelet Volume (MPV) as Biomarkers of Systemic Inflammation in the Diagnosis of Colorectal Cancer. Dis Markers. 2019;2019:6036979.

ANNEXURE I

ETHICAL CLEARANCE CERTIFICATE

B.L.D.E. (DEEMED TO BE UNIVERSITY) IEC/100-09/2021 Date-22/01/2021

(Declared vide notification No. F.9-37/2007-U.3 (A) Dated. 29-2-2008 of the MHRD, Government of India under Section 3 of the UGC Act, 1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11-00 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: Role of Neutrophil-Lymphocyte ratio and platelet lymphocyte ratio as a prognostic marker for febrile seizures.

Name of PG student: , Dr Tejas D, Department of Paediatrics

Name of Guide/Co-investigator: Dr S V Patil, Professor of Paediatrics

DR .S.V.PATIL
CHAIRMAN, IEC
Institutional Ethical Committee
B L D E (Deemed to be University)
Shri B.M. Patil Medical College,
VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.

ANNEXURE II

RESEARCH INFORMED CONSENT FORM

BLDE(DU) Shri B.M. PATIL Medical College, Hospital & Research Centre,Vijayapura-586103.

TITLE OF THE PROJECT : ROLE OF NEUTROPHIL LYMPHOCYTE RATIO AND PLATELET LYMPHOCYTE RATIO AS A PROGNOSTIC MARKER FOR FEBRILE SEIZURES

GUIDE : **DR. S.V PATIL, MD**

PROFESSOR

DEPARTMENT OF PEDIATRICS

PG STUDENT : **Dr. TEJAS D**

POST GRADUATE
DEPARTMENT OF PEDIATRICS

(MD PEDIATRICS)

PURPOSE OF RESEARCH:

I have been informed that the present study will help in determining the role of Neutrophil lymphocyte ratio and platelet lymphocyte ratio as a prognostic marker for febrile seizures along with its recurrence in children admitted to Shri B.M. Patil Medical College Hospital and Research Centre.

PROCEDURE:

I understand that after having obtained a detailed clinical history, thorough clinical examination and relevant investigations, a prospective study of febrile seizures and final follow up of the child.

RISK AND DISCOMFORTS:

I understand there is no risk involved and that the child may experience some pain and discomforts during the examination. This is mainly the result of the condition, and the procedures of this study are not expected to overemphasize these feelings, which are in association with the regular course of treatment.

BENEFITS:

I understand that my participation in the study will have no direct benefit to me other than the potential benefit of the research and education.

CONFIDENTIALITY:

I understand that the medical information produced by this study will become a part of hospital records and will be subject to the confidentiality. Information of sensitive personal nature will not be part of the medical record, but will be stored in the investigations research file.

If the data are used for publication in the medical literature or for teaching purpose, no name will be used and other identifiers such as photographs will be used only with special written permission. I understand that I may see the photograph before giving the permission.

REQUEST FOR MORE INFORMATION:

I understand that I may ask more questions about the study at any time; Dr.TEJAS D at the department of Paediatrics is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during the course of the study, which might influence my continued participation. A copy of this consent form will be given to me to keep for careful reading.

REFUSAL FOR WITHDRAWAL OF PARTICIPATION:

I understand that my participation is voluntary and that I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice. I also understand that Dr.TEJAS D may terminate my participation in the study after he has explained the reasons for doing so.

INJURY STATEMENT:

I understand that in the unlikely event of injury to my child resulting directly from child's participation in this study, if such injury were reported promptly, the appropriate treatment would be available to the child. But, no further compensation would be provided by the hospital. I understand that by my agreements to participate in this study and not waiving any of my legal rights.

I have explained to_____the purpose of the research,

the procedures required and the possible risks to the best of my ability.

_____ _____

Dr. TEJAS D Date

(Investigator)

PARENTS / GUARDIAN CONSENT STATEMENT:

We confirm that Dr. TEJAS D, is doing a study on "ROLE OF NEUTROPHIL LYMPHOCYTE RATIO AND PLATELET LYMPHOCYTE RATIO AS A PROGNOSTIC MARKER FOR FEBRILE SEIZURES" A prospective follow up study.

Dr. TEJAS D has explained to us the purpose of research and the study procedure. We are willing to give as much as information required for the study and consent for investigations and the possible discomforts as well as benefits. We have been explained all the above in detail in our own language and we understand the same. Therefore, we agree to give consent for child's participation as a subject in this research project.

_____ _____

(Parents / Guardian) **Date**

_____ _____

(Witness to signature) Date

PROFORMA

Name :

Age :

Sex :

Chief complaint :

Past history: significant / not significant, if significant specify

Birth history: significant / not significant, if significant specify

Antenatal history

Natal history

Postnatal history

Family history :

VITALS :

TEMPERATURE- HR -

RR- BP-

SYSTEMIC EXAMINATION :

CVS :

RS :

P/A :

CNS :

Diagnosis :

Investigations: COMPLETE HEMOGRAM

TOTAL COUNT :

DIFFERENTIAL COUNT:

Neutrophils- lymphocytes-

NEUTROPHIL-LYMPHOCYTE RATIO -

RED CELL DISTRIBUTION WIDTH :

PLATELET COUNT:

PLATELET-LYMPHOCYTE RATIO -

CRP –

PERIPHERAL SMEAR -

SERUM FERRITIN- TIBC-

Duration of PICU stay :

Duration of hospital stay:

PROGNOSIS:

Timestamp	NAME	AGE	SEX	CHIEF COMPLAINT	PAST HISTORY	BIRTH HISTORY	FAMILY HISTORY	TEMPERATURE	HEART RATE	RESPIRATORY RATE	BLOOD PRESSURE	TOTAL COUNT	NEUTROPHILS	LYMPHOCYTES	NEUTROPHIL-LYMPHOCYTE RATIO (NLR)	PLATELET COUNT	PLATELET-LYMPHOCYTE RATIO (PLR)	CRP	RED CELL DISTRIBUTION WIDTH (RDW)	PERIPHERAL SMEAR	SERUM FERRITIN	TIBC	DURATION OF PICU STAY	DURATION OF HOSPITAL STAY	DIAGNOSIS	FOLLOW UP FOR 6 MONTHS
8/26/2022 0:28:18	ADEEB P YALAPUR	2 YEARS	MALE	FEVER , CONVULSIONS SINCE 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99	84	26	80/60	18100	14480	1991	7.27	345000	173.27	<5	14	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	NO SEIZURES
8/26/2022 0:29:42	Krushika basanagouda patil	3.5yr	Female	Fever since 1day and convulsions 1episode	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	80	26	86/60	21770	16,610	3722	4.46	3,20,000	85	41	14	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	NO SEIZURES
8/26/2022 0:35:15	MADESH IRAPPA TALAKERI	4YEARS	MALE	FEVER,CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	90	26	86/60	22070	17347	3442	5.03	378000	109.79	<5	14	NORMOCYTIC NORMOCHROMI			4	7	SIMPLE FEBRILE SE	LOST TO FOLLOW UP
8/26/2022 0:37:19	Mithun parashuram pujari	2.5yr	Male	Fever since 2days and convulsions of 1episode	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	90	26	80/60	6860	4321.8	2263.8	1.9	156000	68.9	<5	15.5	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/26/2022 0:42:04	Spandan bhimshi melagade	3yr	Male	Fever since 2days and convulsions for 2episode	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	90	26	86/60	14000	7560	5740	1.3	4,27,000	74.39	<5	12.7	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	NO SEIZURES
8/26/2022 0:45:15	NISHTA SULAKE	2YEARS	FEMALE	FEVER, CONVULSION SINCE 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.5	90	26	80/60	16680	9057	6955	1.3	4,62,000	66.4	13.3	13.2	NORMOCYTIC NORMOCHROMI			2	7	SIMPLE FEBRILE SE	NO SEIZURES
8/26/2022 0:51:33	Ganesh Umesh masali	2.5yrs	Male	FeverX3days and convulsion sfor 2episode	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.5	90	26	80/60	4060	1384.46	2440.06	0.56	107,000	43.85	<5	17.2	MICROYTIC HYPOCHROMIC	10	850	2	5	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/26/2022 0:54:52	Ibrahim shafia	2.6yrs	Male	Fever and convulsions since 2daya	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.8	86	24	80/60	27760	19,931.68	6329.28	3.14	5,44,000	85.94	6.1	13.7	NORMOCYTIC NORMOCHROMI			2	7	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/26/2022 0:59:21	SANIYA PARSURAM	3 YEARS	FEMALE	FEVER AND CONVULSION SINCE 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	80	26	80/60	11130	7991	2571	3.1	381000	148.18	43.6	18.6	MICROYTIC HYPOCHROMIC			3	7	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/27/2022 21:24:21	Ariz faheenafsar inamdar	1.6yr	Female	Fever since 1day and uprolling ofeyeball	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	98	88	26	76/60	7680	4224	2764.8	1.52	3,33,000	120.4	26	15.9	NORMOCYTIC NORMOCHROMI			3	7	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/27/2022 21:25:23	PRATIK PRASHANT PADARAL AGI	2 YEARS	MALE	FEVER AND CONVULSION SINCE 2 DAYS	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.4F		90	26 80/60 MMHG	9450	6615	1890	3.5	3,50,000	185.6	14.6	17	NORMOCYTIC NORMOCHROMI			3	7	SIMPLE FEBRILE SE	NO SEIZURES
8/27/2022 21:27:16	Madanku mar M Harichanal	2yr	Male	Fever x 2days and uprolling of eyeball	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	86	28	80/60	16300	13496.4	2184.2	6.17	4,45,000	203.7	10.3	19.9	NORMOCYTIC NORMOCHROMI			4	3	SIMPLE FEBRILE SE	NO SEIZURES
8/27/2022 21:39:20	SHARAT CHANDRASHEKHAR PUJARI	3.5 YEARS	MALE	FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	101	88	26	90/60MM HG	13180	7235.82	4784.34	1.51	224000	46.81	57.7	27.9	MICROYTIC HYPOCHROMIC	18	600	4	7	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/27/2022 21:40:37	Irfan maramsab jaragar	4yrs	Male	Fever x 1day and convulsions x 1episode	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	100.8	96	26	90/60	8440	5199.04	2700.8	1.9	2,64,000	97.7	35.4	14.9	NORMOCYTIC NORMOCHROMI			3	7	SIMPLE FEBRILE SE	NO SEIZURES
8/27/2022 21:46:03	SUMANGALA KASHINATH ILAGER	2YEARS 8 MONTHS	FEMALE	FEVER SINCE 3 DAYS AND CONVULSION 3 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.5F		86	26 90/60	28940	19389	7958	2.43	3,50,000	43.9	36.7	15	MICROYTIC HYPOCHROMIC	11	900	3	5	SIMPLE FEBRILE SE	NO SE3IZURES
8/27/2022 21:54:15	Aadhya Ashok hugar	3 yrs	Female	Fever x 2days, convulsions 1epidose	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99	84	25	90/60	5350	2728.5	1829.7	1.49	5,55,000	303.3	<5	17.7	MICROYTIC HYPOCHROMIC	10	750	2	5	SIMPLE FEBRILE SE	NO SEIZURES
8/27/2022 22:02:11	SAGAR SHIVSHARANAPPA LADANGI	2 YEARS	MALE	FEVER SINCE 1 DAY AND 2 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F		90	26 86/60	10300	8744.7	844.6	10.35	336000	397.8	10	16.5	NORMOCYTIC NORMOCHROMI			2	7	SIMPLE FEBRILE SE	NO SEIZURES
8/30/2022 13:36:06	SHRINIDHI	4YEARS	FEMALE	FEVER SINCE 1 DAY AND CONVULSION 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F		84	26 90/60MM HG	15,510	13105	1613	8.12	282000	174.82	10.3	16.6	MICROYTIC HYPOCHROMIC	20	710	4	7	SIMPLE FEBRILE SE	NO SEIZURES
8/30/2022 13:40:23	ANANYA SHRISHAIL BELLUR	3YEARS	FEMALE	FEVER SINCE 2 DAYS AND CONVULSION 2 EPISODES	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.5	94	28	86/60	9370	6559	843.3	7.7	340000	403	20.1	15.9	NORMOCYTIC NORMOCHROMIC	94	344	3	7	SIMPLE FEBRILE SE	NO SEIZURES
8/30/2022 13:56:27	SHIVAM SANTOSH	2.5YEARS	FEMALE	C/O FEVER SINCE 2 DAYS AND ABNORMAL MOVEMENTS OF UPPER AND LOWER LIMB	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.8F		90	26 86/60	32550	24738	6477	3.81	95000	14.6	16.4	17.9	NORMOCYTIC NORMOCHROMIC	79	300	5	7	SIMPLE FEBRILE SE	LOST TO FOLLOOW UP
8/30/2022 14:05:55	MUSKAN	1YEAR	FEMALE	FEVER SINCE YESTERDAY AND CONVULSION 2 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.8F		104	24 100/60	17120	9826	5906	1.66	404000	68.4	5.7	16	MICROYTIC HYPOCHROMIC	15	750	3	5	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
8/30/2022 14:09:25	UTVIKA	1YEARS	FEMALE	FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F		96	26 90/60	11450	9045	1488.5	6.07	227000	152.5	18.3	14	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	LOST TO FOLLOW UP
8/30/2022 14:12:50	SHIVANI	3YEARS	FEMALE	FEVER SINCE 1 DAYS AND 1 EPISODE CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99F		90	22 90/60MM HG	6730	3903	2146.87	1.81	3,96,000	184.45	143.2	15.5	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	NO SEIZURES
8/30/2022 14:16:45	SIDDHARTH	3YEARS	MALE	FEVER AND CONVULSION SINCE 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	96	22	96/60MM HG	7100	4686	2130	2.2	321000	138	LESS THAN 6	13.5	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	LOST TO FOLLOW UP
8/30/2022 14:21:19	KRITHI PATIL	2 YEARS	FEMALE	FEVER SINCE 1 DAY AND CONVULSION SINCE 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.1	98	24	90/60	2680	1109.52	1420.4	0.78	212000	149.2	76.4	13.2	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	1 EPISODE SEIZURE

8/30/2022 14:26:09	PRERNA GANGAD HAR	3YEARS	FEMALE	FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.5		90	22	90/60	9560	7456	1529	4.87	361000	236	15	14	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/30/2022 15:28:12	Mariyam jafar	10m	Female	Fever and convulsion	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F		98	26	80/50mm hg	6100	2976	2812	1.05	318000	113.08	44	14.1	MICROYTIC HYPOCHROMIC ROMIC	15	700	2	5	SIMPLE FEBRILE SEIZURES	1 EPISODE SEIZURE
8/30/2022 22:07:48	AYUSHMAN PARNAN KAR	11MONTHS	MALE	FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.6		96	24	90/60MM HG	25320	19141	4658	4.1	3,09,000	66.3	52	14.3	MICROYTIC HYPOCHROMIC			3	6	SIMPLE FEBRILE SEIZURES	1 EPISODE SEIZURE
8/30/2022 22:16:29	SWATI SHANKAR	1 YEAR	FEMALE	FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101	99/MIN	42/MIN		100/70MM HG	31580	24790	4800	5.16	542000	42.91	28.7	17.3	MICROYTIC HYPOCHROMIC	14	780	3	6	SIMPLE FEBRILE SEIZURES	MO SEIZURES
8/30/2022 22:25:29	ABDULLA ABUL NAIR	1YEAR 1 MONTH	MALE	FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.4F	99/MIN	28/MIN		100/60 MM HG	26950	19107	6090.7	3.137	4,42,000	72.56	<5	14.2	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/30/2022 22:41:41	UDAY SANTOS RATHOD	1YEAR 4 MONTH	MALE	FEVER AND CONVULSION SINCE 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	96/MIN	28/MIN		90/60MM HG	12910	6558.2	5422	1.2	285000	52.5	<5	15	MICROYTIC HYPOCHROMIC ROMIC	15	800	3	6	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/30/2022 23:11:16	SHRESTA S SAJJAN	1 YEAR 5 MONTHS	MALE	FEVER SINCE 2 DAYS AND 2 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F		96	28	90/60	12560	89929	2876	3.12	249000	86.57	28.4	14.2	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURES	1 EPISODE SEIZURE
8/30/2022 23:37:51	RIDHA MD RAFIQ JAMADAR	11 MONTH	FEMALE	FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.7F	92/MIN	32/MIN		90/70MM HG	10360	9023	1212	7.44	318000	262.35	54.8	13.1	NORMOCYTIC NORMOCHROMIC			4	6	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/30/2022 23:50:10	WAGESH PRAKASH	2YEARS	MALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101		98	29	100/70	21510	17745	2930	6.11	424000	146	<5	13.8	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 0:12:12	AMAN SHBBIR MULLA	2 YEARS	MALE	C/O FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	98/MIN	28 CPM		100/70MM HG	12770	6359.4	5312.3	1.197	413000	77.7	143.3	14.7	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 0:26:01	SRINIDHI	1YEAR 4 MONTH	FEMALE	FEVER SINCE 1 DAY AND CONVULSION SINCE 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.8	112BPM	32CPM		100/60MM HG	12280	9136	2505	3.64	347000	138.51	<5	15.8	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURES	LOST TO FOLLOOW UP
8/31/2022 16:13:21	GAYATRI	3YEARS	FEMALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 2 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.6	96/MIN	32/MIN		100/60MM HG	16420	14942	1231	12.13	397000	322	7.6	17	MICROYTIC HYPOCHROMIC ROMIC	10	900	4	7	COMPLEX FEBRILE SEIZURES	1 EPISODE SEIZURE
8/31/2022 16:21:36	SHARATH NAYAK	2YEARS 9 MONTH	MALE	C/O FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101		86	28	90/70MM HG	5040	2938	1799	1.63	153000	85	<5	17.8	MICROYTIC HYPOCHROMIC ROMIC	16	800	3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 16:29:03	MALLIKA RJUN	3YEARS 5 MONTH	MALE	FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.6F	96/MIN	30/MIN		90/60MM HG	10030	8204	1333.99	6.15	2,29,000	171.66	11.2	13.2	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 16:41:18	AHARIA ASALAM NADAF	2 YEARS	FEMALE	C/O FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101		100	28	90/60MM HG	16830	13649	2423.5	5.36	467000	192.6	34	14.8	NORMOCYTIC NORMOCHROMIC			4	6	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 16:52:47	SHARAN BASU TIPPARAY	4YEAR 6 MONTHS	MALE	FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.8		88	23	100/70MM HG	8230	6732.1	543.18	1.2	206000	37.9	23.1	13.8	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 17:02:53	RADHIKA RAJU YELEGAO	1YEAR 4MONTH	FEMALE	C/O FEVER SINVE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.7F	116/MIN	28/MIN		90/60 MMHG	15250	5993.2	8219.7	0.7	369000	44.89	39.5	13.5	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 17:12:12	KUSHI KISHOR JADHAV	2YEAR 3MONTH	FEMALE	C/O FEVER AND CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.4F	99/MIN	29/MIN		100/70MM HG	5300	3158	1552.9	2.03	278000	179	<5	16	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 17:19:47	MEGNA SHARANAPPA TALAWAR	1YEAR 8MONTH	FEMALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.8F	98/MIN	32/MIN		90/60MM HG	7560	3795.1	3039	1.24	192000	6.31	9.1	13	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
8/31/2022 21:47:10	RADHIKA RAJU YELEGAOO	1YEAR 4 MONTHS	FEMALE	FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.7F		116	28	90/60 MMHG	15250	5993.2	8219	0.7	369000	44.89	39.5	13.5	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	LOST TO FOLLOW UP
########	SAHANA RAJU MADAR	1 YEAR 7 MONTHS	FEMALE	C/O FEVER AND C/O CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100		96	24	90/60	8430	2318	5530	0.419	459000	83	61.1	15.9	MICROYTIC HYPOCHROMIC ROMIC	13	780	2	5	SIMPLE FEBRILE SEIZURES	1 EPISODE SEIZURE
########	Sangmesh bommanh alli	1year 6 months	Male	Fever and convulsion	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	101		128	30	90/60	7860	2845	4024	0.7	482000	119.7	<5	12.8	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
########	Vijay Kumar hosamani	1year 6month	Male	Fever and convulsion 2episode	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100		98	28	90/60	10,670	6305.97	3478	1.812	4,92,000	141.44	7.6	17.5	MICROYTIC HYPOCHROMIC ROMIC	12	850	4	7	COMPLEX FEBRILE SEIZURES	NO SEIZURES
########	SIYANAR AH M SHEIKH	3 YEARS 9 MONTH	MALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 2 EPISODE	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	100.7		106	29	100/70	7790	6161	1113	5.53	194000	174.15	9.3	15.1	NORMOCYTIC NORMOCHROMIC			3	5	COMPLEX FEBRILE SEIZURES	NO SEIZURES
########	UMERA MD SHAFIQ INAMDAR	1YEAR	MALE	C/O CONVULSION 1 EPISODE AND C/O FEVER SINCE 1 DAY	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	102		98	42	90/70	10140	4857	4400	1.1	425000	96.57	<5	14.1	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
########	PIYUSH RATHOD	4YEARS 1 MONTH	MALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101		120	28	110/70MM HG	18090	14526.2	2731	5.31	266000	97.3	21.8	13.1	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURES	NO SEIZURES
########	PRATIK PUJARI	3YEARS AND 8 MONTHS	MALE	C/O FEVER SINCE 2 DAYS AND CONULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101F		106/MIN	24/MIN	100/70MM HG	8230	6732.1	543.18	12.39	206000	379.2	28.4	11.4	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES

########	AKASH AMBARE SH GUARG	2YEARS 7 MONTHS	MALE	C/O FEVER SINCE 3 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F	142/MIN	26/MIN	100/60MM HG	24840	18630	4719	3.9	415000	87.9	18.6	21.7	MICROYTIC HYPOCHROMIC	12	890	4	7	SIMPLE FEBRILE SEIZURE	NO SEIZURES
########	ANUSHREE SHUBHASH NAIKAR	1YEAR 6 MONTHS	FEMALE	C/O FEVER SINCE 1 DAY AND C/O CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F	142	42	100/60	7070	3718	2898.7	1.28	369000	127.29	82.8	13.9	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURE	LOST TO FOLLOW UP
########	SWARA RAMAKRISHNA	1 YEAR	FEMALE	C/O FEVER SINCE 2 DAYS	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	98F	136/MIN	42/MIN	90/60MM HG	8890	6223	1866.9	3.33	354000	189.61	16	10	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURE	LOST TO FOLLOW UP
########	SAMARTH RAMAPPA HARIJAN	4YEAR 8 MONTHS	MALE	C/O FEVER SINCE 3 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F	128/MIN	28/MIN	110/60MM HG	11330	10083	906	11.1	132000	145.6	13.1	13.7	NORMOCYTIC NORMOCHROMIC			4	6	SIMPLE FEBRILE SEIZURE	NO SEIZURES
########	ANIRUDDA R BAGALKOT	1 YEAR 8 MONTH	MALE	C/O FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	98.7F	136/MIN	28/MIN	90/60MM HG	7180	4774.7	1680	2.8	189000	112.5	<5	20.8	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURE	NO SEIZURES
########	KAVERI NINGAYYA MATAPATHI	1YEAR 3MONTH	FEMALE	FEVER SINCE 3 DAYS AND CONVULSION 1 EOISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	102	136/MIN	42/MIN	90/50MM HG	9900	7880	1207	6.5	458000	379	18.3	14	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURE	NO SEIZURES
########	SAKET SHRISAIL SAVALI	9MONTHS	MALE	C/O FEVER SINCE 1 DAY AND 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101F	138/MIN	46/MIN	80/60MM HG	5810	3962	1469	2.69	442000	300.8	14.3	15.8	MICROYTIC HYPOCHROMIC	12	820	2	5	SIMPLE FEBRILE SEIZURE	NO SEIZURES
########	ANIRUDHA R BAGALKOT	2YEARS	MALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 2 EPISODE	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	100	141	36	100/70MM HG	7180	4747	1680	2.84	189000	112.49	<5	20.8	MICROYTIC HYPOCHROMIC	12	800	2	6	COMPLEX FEBRILE SEIZURES	NO SEIZURES
########	VEDANTH A HARKOLE	1YEAR 6 MONTHS	MALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99F	136/MIN	42/MIN	100/80MM HG	7880	6036	1182	5.1	199000	168.35	6.2	13.1	NORMOCYTIC NORMOCHROMIC			4	7	SIMPLE FEBRILE SEIZURES	NO SEIZURES
########	PREETA MGOUDAP	4YEARS	MALE	C/O FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	100.6	106	42	100/80	3730	2797.5	690.5	4.05	213000	308.67	15.5	12.8	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
########	MAYAURI KHOLI	1YEAR 2 MONTHS	FEMALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F	128/MIN	56/MIN	80/60	8920	5120	3014	1.69	467000	154.89	<5	15	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURE	1 EPISODE
########	KASPIYA TORPI	3 YEARS	FEMALE	C/O FEVER SINCE 2 DAYS AND 1 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101F	98/MIN	28/MIN	100/60 MMHG	7170	2703	3147	0.8	347000	110	9.2	110	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURE	NO SEIZURE
########	SAHAFIYA SACHIN KADIBAGI	1YEAR	MALE	C/O FEVER SINCE 2 DAYS AND 1 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101F	132/MIN	46/MIN	90/60MM HG	18420	7920	9578	0.8	286000	29.8	24.8	13.4	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURE	NO SEIZURE
########	ARJUN SANTOSH BARNAL	11MONTHS	MALE	C/O FEVER AND 1 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101	152/MIN	48/MIN	90/60	16920	15058	1455	10.3	552000	379	7.3	19.6	MICROYTIC HYPOCHROMIC	14	790	3	6	SIMPLE FEBRILE SEIZURE	NO SEIZURE
########	LALSAB SURESH	3YEARS 8 MONTHS	MALE	C/O FEVER SINCE 1 DAY AND C/O CONVULSION1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99.8F	110/MIN	36/MIN	90/60 MMHG	7960	5444.4	1990	15.4	138000	69.34	<5	15.4	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURE	NO SEIZURE
########	MUTTU ASHOK DONNUR	1YEAR 7 MONTHS	MALE	C/O FEVER AND CONVULSION 2 EPISODES	NOT SIGNIFICANT	SIGNIFICANT	NOT SIGNIFICANT	101F	136/MIN	42/MIN	90/50MM HG	18570	14558	3286	4.4	615000	187.1	23.7	16.6	MICROYTIC HYPOCHROMIC	8	864	4	7	COMPLEX FEBRILE SEIZURES	NO SEIZURES
########	KIRTHI H PATIL	2YEARS 1MONTH	FEMALE	C/O FEVER AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F	142/MIN	36/MIN	100/60MM HG	2680	1098	1420	0.7	212000	149	76.4	13.2	NORMOCYTIC NORMOCHROMIC			2	5	SIMPLE FEBRILE SEIZURES	NO SEIZURES
########	CHIRANJEEVI PARAGOND	1YEAR 2MONTH	FEMALE	C/O FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	102	118/MIN	32/MIN	90/60MM HG	6420	1649.9	4442.6	0.37	206000	46.3	9.3	22.3	MICROYTIC HYPOCHROMIC	8	864	2	5	SIMPLE FEBRILE SEIZURE	1 EPISODE
########	PRIYANKA BASLINGAYYA SAKRI	2YEARS 9 MONTHS	FEMALE	C/O FEVER SINCE 2 DAYS AND C/O CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	102F	128/MIN	46/MIN	100/60MM HG	9330	7855	1194.2	6.5	423000	354	50.5	14.4	NORMOCYTIC NORMOCHROMIC			3	6	SIMPLE FEBRILE SEIZURE	NO SEIZURE
########	SHREYA SURAJ RAJPUT	3YEARS	FEMALE	C/O FEVER SINCE 2 DAYS AND CONVULSION 2 EPISODE	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	101F	110/MIN	32/MIN	110/60MM HG	5750	4341.25	1259.25	3.44	271000	215	19.4	14.6	NORMOCYTIC NORMOCHROMIC			3	5	SIMPLE FEBRILE SEIZURE	NO SEIZURE
########	SAMIRA ASMEESAB JAMKHANDI	11MONTHS	FEMALE	C/O FEVER SINCE 1DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100.7F	128/MIN	46/MIN	80/60MM HG	26090	15393.1	8557.52	1.79	311000	36.34	>90	14.8	MICROYTIC HYPOCHROMIC	10	900	4	7	SIMPLE FEBRILE SEIZURES	NO SEIZURES

########	SANTOSH HANUMANTH PUJARI	1YEAR 6MONTHS	MALE	C/O FEVER SINCE 2 DAYS AND 1 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	142	45	80/50MM HG	17350	6037	10271	0.58	339000	33	37.1	17.6	MICROYTIC HYPOCHROMIC	12	850	3	7	SIMPLE FEBRILE SE	LOST TO FOLLOW UP
########	Sampath	3years	Female	C/o fever and convulsion	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	99	90	22	90/60mm hg	4390	2853	1273	2.241	226000	177.5	>90	17	MICROYTIC HYPOCHROMIC	10	800	3	6	SIMPLE FEBRILE SE	LOST TO FOLOW UP
########	Preetam sabegoudra	6months	Male	Fever since 2days	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	102	110	26	86/60	269000	16947	8070	2.1	556000	68.89	22.1	15	NORMOCYTIC NORMOCHROMI			4	7	COMPLEX FEBRILE	LOST TO FOLLOW UP
########	Amaira	3years 9months	Female	C/ofever and convulsion 3episode	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	99	90	22	90/60	9520	8187.2	761.8	10.74	212000	278.2	24.6	14	NORMOCYTIC NORMOCHROMI			5	7	COMPLEX FEBRILE	LOST TO FOLLOW UP
########	Azan atahulla sayyad	1 yr 3 months	Male	Fever,convulsion 2 episodes	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	100F	128/min	38/min	80/60	10,500	28.6	66.90%	28,6/66.9 %	3,24,000	3,24,000	14.9	155.6	NORMOCYTIC NORMOCHROMIC	12	680	4	5	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
########	M D Ali	2years	Male	C/O convulsion	K/C/O FEBRILE SEIZURES	SIGNIFICANT	NOT SIGNIFICANT	100	116/min	28/min	100/60	11,190	4.64	17.35%	80.40%	5,33,000	17.30%	14.9	13.5	MICROYTIC HYPOCHROMIC	12	680	4	5	COMPLEX FEBRILE	NO SEIZURE
########	Sidharth	8 MONTHS	Male	C/o of fever and convulsions lasting for 8min	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	101	119	46	100/70mm hg	12,100	10,164	774	13.13	196000	253	22.9	13.3	NORMOCYTIC NORMOCHROMI			4	7	COMPLEX FEBRILE	LOST TO FOLLOOW UP
########	Sharangouda	1yr	Male	C/o fever since 1 day seizures 1 episode	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	102	142	34	90/60	18,910	10,004	6912	55.5%/38 %	4,69,000	67.8	17.5	16.7	NORMOCYTIC NORMOCHROMI			3	6	SIMPLE FEBRILE SE	1 EPISODDE SEIZURE
9/20/2022 13:59:44	mahadevapp	1 YEAR	MALE	C/O FEVER AND 1 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100F		132	28	90/70MM HG	18900	10395	8505	1.2	337000	39.6	17.5	16.7	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	1 EPISODE SEIZURE
9/20/2022 14:03:37	NASEER NADAF	2YEARS	MALE	FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101	98	28	100/70	12390	9788	2602	3.7	311000	119.9	8.1	16.6	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	LOST TO FOLLOW UP
9/20/2022 14:07:34	JAKSHINI	2YEARS	FEMALE	FEVER SINCE 1 DAY AND 2 EPISODE OF CONVULSION	K/C/O FEBRILE SEIZURES	NOT SIGNIFICANT	NOT SIGNIFICANT	103	160	38	100/60	20260	15195	5065	3	4,04,000	80	7.4	13.7	NORMOCYTIC NORMOCHROMI			3	6	COMPLEX FEBRILE	NO SEIZURE
9/20/2022 14:20:28	VIRAT PARMAG	1 year	MALE	C/O FEVER SINCE 1 DAY AND 1 EPISODE OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	98F	128/MIN	26/MIN	110/70 MMHG	8650	8131	519	15.9	287000	552	6	12.6	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	NO SEIZURE
9/20/2022 14:40:42	DEEPA SADASHIV	10 MONTHS	FEMALE	C/O FEVER SINCE 1 DAY. C/O CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	100/MIN		90/60 24 MMHG	6660	3862	2798	1.3	296000	105	52.1	15.3	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	LOST TO FOLOOW UP
9/20/2022 14:46:14	TARUN D	7 months	MALE	C/O FEVER SINCE 2 DAYS EISODE 1 OF CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	98	32	110/70	12310	6524	5786	01:01	252000	43.5 (5		13.4	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	NO SEIZURE
9/20/2022 14:50:08	AZAN	1YR	MALE	C/O FEVER C/O CONVULSION	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	124	28	100/60	12420	8669	3751	2.3	337000	89.84	14.9	15.6	NORMOCYTIC NORMOCHROMI			4	6	SIMPLE FEBRILE SE	NO SEIZURES
9/27/2022 18:49:29	TARUN	5 YEARS	MALE	C/O CONVULSION AND FEVER	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	100	120	32	100/60	11460	8251	3209	2.5	420000	130	59	13.6	NORMOCYTIC NORMOCHROMI			4	5	SIMPLE FEBRILE SE	NO SEIZURE
9/27/2022 18:52:29	SAMEER	6 MONTHS	MALE	C/O FEVER nd convulsion	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT	101	126	28	80/60mm hg	6660	3882	2664	1.4	296000	111	52.1	15.3	NORMOCYTIC NORMOCHROMI			2	5	SIMPLE FEBRILE SE	LOST TO FOLLOW UP
9/27/2022 18:58:01	SUJITH	11MONTHS	MALE	C/O FEVER SINCE 1 DAY AND CONVULSION 1 EPISODE	NOT SIGNIFICANT	NOT SIGNIFICANT	H/O SEIZURE DISORDER IN SIBLING	101	118	36	80/60MM HG	11800	8620	2360	3.6	405000	171.6	<5	14.9	NORMOCYTIC NORMOCHROMI			3	5	SIMPLE FEBRILE SE	NO SEIZURES