







**Comparison of neutrophil count with raised and normal neutrophil**

In this study the cardiogenic shock was noted in 40 subjects in which 28 were from raised neutrophil group and 12 were from normal neutrophil group, similarly the cardiogenic shock not found in 29 subjects in which 20 were from raised neutrophil group and 9 were from normal neutrophil group shown in **Table#4**

		Neutrophil		Total
		Raised	Normal	
Cardiogenic shock	Yes	28	12	40
	No	20	9	29
Total		48	21	69

**Table#4**

**Comparison of cardiogenic shock with neutrophil (n=69)**

Out of 69 subjects the pulmonary edema was noted in 33 subjects in which 23 were from raised neutrophil group and 10 were from normal neutrophil group, similarly the pulmonary edema not found in 36 subjects in which 25 were from raised neutrophil group and 11 were from normal neutrophil group shown in **Table#5**

		Neutrophil		Total
		Raised	Normal	
Pulmonary Edema	Yes	23	10	33
	No	25	11	36
Total		48	21	69

**Table#5**

**Comparison of pulmonary edema with neutrophil (n=69)**

The study results showed that the arrhythmia was found in 43 subjects in which 31 were from raised neutrophil group and 12 were from normal neutrophil group, similarly the arrhythmia not found in 26 subjects in which 17 were from raised neutrophil group and 9 were from normal neutrophil group shown in **Table#6**

		Neutrophil		Total
		Raised	Normal	
Arrhythmia	Yes	31	12	43

	No	17	9	26
Total		48	21	69

**Table#6**

**Comparison of arrhythmia with neutrophil (n=69)**

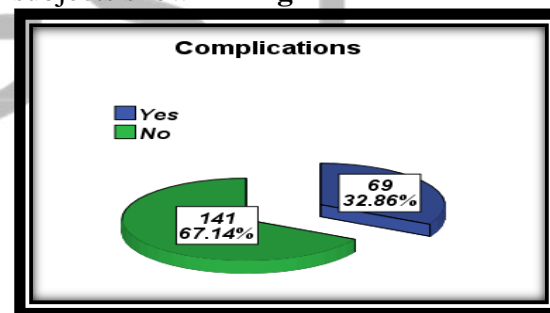
In this study the mortality occurred in 30 subjects in which 23 were from raised neutrophil group and 7 were from normal neutrophil group, similarly the mortality not occurred in 39 subjects in which 25 were from raised neutrophil group and 14 were from normal neutrophil group shown in **Table#7**

		Neutrophil		Total
		Raised	Normal	
Mortality	Yes	23	7	30
	No	25	14	39
Total		48	21	69

**Table#7**

**Comparison of mortality with neutrophil (n=69)**

Out of 210 subjects the complications were noted among 69(32.86%) subjects and it was not found among 141(67.14%) subjects shown in **Fig#2**



**Fig#2**

**Frequency distribution of complications**

The study results showed that the complications found in 69 subjects in which 48 were from raised neutrophil group and 21 were from normal neutrophil group, similarly the complications not found in 141 subjects in which 57 were from raised neutrophil group and 84 were from normal neutrophil group. Statistically 1.72 times more risk of complications noted in raised neutrophil group compared to normal neutrophil group. i. e RR=1.71 [1.33-2.22] shown in **Table#8**

**Table#8**  
**Comparison of complications with neutrophil**

	Yes	Neutrophil		Total	RR
		Raised	Normal		
Complications	48	21	69	1.72	[1.33]
	No	57	84	141	-
<b>Total</b>	<b>105</b>	<b>105</b>	<b>210</b>	<b>2.22</b>	

Chi value=15.74

p-value=0.001\*

The study results showed that in  $\leq 50$  years patient the complications found in 28 subjects in which 17 were from raised neutrophil group and 11 were from normal neutrophil group. Similarly in  $>50$  years subjects, the complications were found in 41 subjects in which 31 were from raised neutrophil group and 10 were from normal neutrophil group. Statistically 2.11 times more risk of complications noted in raised neutrophil group compared to normal neutrophil group in  $>50$  years subjects. i. e RR=2.11 [1.49-2.97] shown in **Table#9**

Age (years)	Complications	Neutrophil		Total	RR	p-value
		Raised	Normal			
$\leq 50$	Yes	17	11	28	1.32	0.19 NS
	No	29	34	63	[0.88-1.96]	
$> 50$	Yes	31	10	41	2.11	0.001*
	No	28	50	78	[1.49-2.97]	

**Table#9**

**Comparison of complications with neutrophil stratified by age**

The study results showed that in male patient the complications found in 35 subjects in which 25 were from raised neutrophil group and 10 were from normal neutrophil group. Similarly in female subjects, the complications were found in 34 subjects in which 23 were from raised neutrophil group and 11 were from normal

neutrophil group. Statistically 1.52 & 1.95 times more risk of complications noted in raised neutrophil group compared to normal neutrophil group stratified by gender. i. e RR=1.52 [1.09-2.12] & 1.95 [1.32-2.87] shown in **Table#10**

Gender	Complications	Neutrophil		Total	RR	p-value
		Raised	Normal			
Male	Yes	25	10	35	1.52	0.01*
	No	31	35	66	[1.09-2.12]	
Female	Yes	23	11	34	1.95	0.0013*
	No	26	49	75	[1.32-2.87]	

**Comparison of complications with neutrophil stratified b gender**

**DISCUSSION:**

In spite of great advances in diagnosis and management, ST segment elevation myocardial infarction (STEMI), it remains a major public health problem in the industrialized world and is on the rise in developing countries.

The relationship between myocardial infarction (MI) and inflammation has been suggested over 50 years ago.<sup>03</sup> Determining the peripheral leukocyte count is an inexpensive and widely available way to assess the presence of any inflammation. Myocardial Infarction is usually accompanied with peripheral leukocytosis and the leukocytosis is associated with higher rates of short-term mortality and heart failure after myocardial infarction.<sup>02</sup>

Neutrophils are the major leukocytes in the peripheral blood.<sup>05 06</sup>

Various clinical trials have reported an association between increased neutrophil count in peripheral blood and short-term post-MI adverse outcomes and worse angiographic findings. Amongst different hematological indices, it has been shown that the neutrophil/lymphocyte ratio

(NLR) has the highest predictive value in predicting MI/Death in high risk patients for coronary artery disease<sup>04</sup>.

Acute Heart Failure (AHF) is a term used to describe the rapid onset of or change in signs and symptoms of heart failure.<sup>07</sup> The prevalence of the Heart Failure is increasing due to the risk of coronary artery disease. In addition, AHF is associated with increased morbidity and mortality.<sup>08</sup> Therefore, the early identification of patients with high risk of acute heart failure is important. Also, it has been shown that raised neutrophil count and NLR predicts the long term mortality in patients hospitalized with ST elevation myocardial infarction (STEMI), and in patients undergoing percutaneous coronary intervention (PCI).<sup>09</sup>

The study published by Azab B et. al<sup>10</sup> also demonstrated that NLR is an independent predictor of short-term and long-term mortalities in patients with STEMI. The study conducted by Chatterjee S et al<sup>11</sup> suggests a pre-procedural elevated WBC count, neutrophils and elevated N/L ratio are predictors of significant ventricular arrhythmias in patients undergoing percutaneous coronary intervention (PCI). In our study the complications were noted among 69(32.86%) subjects in whom 48 were from raised neutrophil group and 21 were from normal neutrophil group. According to our study results 1.72 times more risk of complications noted in raised neutrophil group compared to normal neutrophil group. i. e RR=1.71 [1.33-2.22].

Various clinical trials have reported an association between increased neutrophil count in peripheral blood and short-term post-MI adverse outcomes and worse angiographic findings.<sup>12-14</sup> A study by Ghaffari S. et. al<sup>02</sup> presented that the leukocyte (P<0.03) and neutrophil counts (P<0.03) and higher NLR (P=0.01) were predictors of failure. The frequency of ventricular tachyarrhythmias (VT/VF) at the first day was associated with higher neutrophil count (P<0.001) and higher

NLR level (P<0.001). In multivariate analysis neutrophil count was an independent predictor of mortality (OR=2.94; 1.1-8.4, P=0.04), and neutrophil count [OR=1.1, CI (1.01-1.20), P=0.02].

Another study by Zahoor Ahmed Khan et al<sup>15</sup> concluded that Patients with Non ST Segment elevation Myocardial Infarction with high Neutrophil to lymphocyte ratio, is a good predictor of In-hospital mortality, atrial fibrillation and ST segment deviation.

The study published by Azab B et al.<sup>10</sup> also demonstrated that NLR is an independent predictor of short-term and long-term mortalities in patients with STEMI.

The study conducted by Chatterjee S et al<sup>11</sup> suggests a pre-procedural elevated WBC count, neutrophils and elevated N/L ratio are predictors of significant ventricular arrhythmias in patients undergoing PCI.

Barron et al. demonstrated that there was an association between high leukocyte count and incidence of cardiogenic shock or congestive heart failure. They reported a higher mortality in patients with more intense increase in WBC count.<sup>16</sup>

One study by Uzma Gul et al<sup>17</sup> revealed that the NLR an independent predictor of mortality (OR 1.131 at 95% CI, p = 0.029). A high NLR predicted increased in hospital complication rate, and in-hospital as well as 30-day mortality in STEMI patients thrombolysed with streptokinase. Chia et al. showed that elevated leukocyte and neutrophil counts after primary PCI in patients with STEMI were associated with larger myocardial infarct size and lower LVEF and were independent predictors of cardiovascular outcome.<sup>09</sup>

### **CONCLUSION:**

It has been proved in our study that there is 1.72 times significantly more risk of in hospital mortality and complications after STEMI in raised total Neutrophil Count than to normal Neutrophil Count.

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