INTRODUCTION
One of the most common reasons paediatric patients are admitted is acute gastroenteritis. In developing countries, it is a major cause of morbidity and mortality among children [1]. Regardless of the cause of the diarrhoea, fluid loss can lead to serious complications that necessitate hospitalisation or even prove fatal if proper measures are not taken quickly enough. Diarrhea and dehydration can be caused by a variety of pathogens, including bacteria and viruses [2].

Diarrhea is caused by two mechanisms: damage to the villous brush border and the release of toxin, which can cause an increase in intestinal fluid secretion beyond the digestive tract's capacity. Even though diarrhoea is still common, the number of children who visit their paediatrician because of diarrhoea and its complications has decreased significantly [3]. The use of oral rehydration solution has been linked to a decrease in diarrheal disease mortality. Because the sodium coupled solute co-transport mechanism remains intact even in severe diarrhoea, oral rehydration solution is effective in treating diarrheal diseases in children [4]. Increased frequency and altered stool consistency are the most common symptoms in children with simple diarrhoea. Vomiting and abdominal pain are common side effects. Dehydration-related complications like hypovolemic shock and renal failure can develop in these children if proper treatment is not provided. This can cause neurological symptoms like lethargy, irritability, and convulsions in some children.

Dehydration, electrolyte imbalance, and other consequences of untreated diarrhoea can be disastrous in children under the age of 5, especially [6]. Children with diarrhoea are more likely to have electrolyte imbalances, such as hypokalemia, hyponatremia, and altered urea and creatinine. In these kids, it's unusual to see hyperkalemia or hypernatremia. It's important to treat electrolyte imbalances when they occur in patients with diarrhoea by replacing sodium or potassium deficiency with normal levels. Patients who receive only intravenous fluids while in the hospital are more likely to develop hypernatremia dehydration [7]. Newborns and infants are also susceptible, and symptoms such as irritability, loud crying, and weakness are common. It can present as altered sensorium, diuresis, and fever in older children. Dehydration that results in hypernatremia necessitates replenishing the body's water reserves. This water deficit in the body must be made up by drinking enough fluid to make up for the loss. The amount of fluid needed depends on the total water deficit in the body and the sodium concentration in the fluid being consumed.

An electrolyte imbalance can be treated with oral rehydration solution, intravenous fluids, and electrolyte balance correction. Patients who arrive at the hospital dehydrated may require admission to a paediatric intensive care unit where they will receive appropriate intensive care as well as shock management. Rehydration and electrolyte balance correction may be necessary in cases where bacterial aetiology is confirmed, in addition to appropriate antibiotics [9].

We conducted present study with aimed to determine the frequency of sodium and potassium abnormalities in
children having ages upto 5 years and presented with acute diarrhea.

MATERIALS AND METHODS
This prospective/cohort study was conducted at Pediatric department of North West General Hospital, Peshawar during the period from July 2020 to June 2021 (for one Year). Total 130 patients of both genders having age up to 5 years presented with acute diarrhea were enrolled in this study. Clinical examination was done after taking written informed consent from patients parents/guardians. All patients were asked about their age, gender, height, and weight. The parents’ or guardians’ socioeconomic standing was also taken into consideration. It was also noted if the patient had any co-existing illnesses. To get an accurate picture of the patient's health history, we looked at things like stool frequency, vomiting, pain in the abdominal area, and how much the baby cried. We also looked at things like lethargy and refusal to feed in infants. Those who were excluded included children under the age of one month (Neonates), seriously ill patients, children with serious co-morbid conditions that could have an impact on the outcome, and children who had diarrhoea for more than two weeks (persistent diarrhoea).

Before being admitted to the hospital, caregivers were questioned about the history of giving the child ORS, and if it had been, the procedure for making ORS was specifically requested to determine whether or not preparing ORS was appropriate. A variety of ORS preparations were used depending on the history provided by parents or caregivers, such as concentrate or dilute. Dehydration signs and severity were discovered after a thorough clinical examination. A stool test was performed.

In all patients 2 ml venous blood was collected and serum sodium and serum potassium levels were determined. Hypokalemia was defined as potassium level <3.5 mmol/l and sodium level <130 mmol/l was defines as hyponatremia. All the data was analyzed by SPSS 24.0.

RESULTS
Out of 130 patients, 72 (55.38%) were males while 58 (44.62%) patients were females. Mean age was 2.38±1.52 years. Mean disease duration was 3.54±1.33 days. 70 (53.85%) patients had urban residence while 60 (46.15%) had rural residency. 40 (30.77%) patients had low socio-economic status, 60 (46.15%) had middle and 30 (23.08%) had high socio-economic status. (Table 1)

Table No 1: Baseline details of all the patients

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency No.</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>2.38±1.52</td>
<td>-</td>
</tr>
<tr>
<td>Disease Duration (days)</td>
<td>3.54±1.33</td>
<td>-</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>72</td>
<td>55.38</td>
</tr>
<tr>
<td>Female</td>
<td>58</td>
<td>44.62</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>70</td>
<td>53.85</td>
</tr>
<tr>
<td>Rural</td>
<td>60</td>
<td>46.15</td>
</tr>
<tr>
<td>Socio-economic Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>40</td>
<td>30.77</td>
</tr>
<tr>
<td>Middle</td>
<td>60</td>
<td>46.15</td>
</tr>
<tr>
<td>High</td>
<td>30</td>
<td>23.08</td>
</tr>
</tbody>
</table>

According to the clinical presentation, all patients had loose motion 130 (100%), 90 (69.23%) patients had abdominal pain, 45 (34.62%) had fever, 38 (29.23%) patients had vomiting, and 35 (26.92%) had lethargy. (Figure 1)

We found that 40 (30.77%) patients had serum sodium level <3.5 mmol/l (hyponatremia) while 90 (69.23%) patients had serum sodium level in normal range. (Figure 2)

Hypokalemia was observed in 52 (40%) patients with potassium level <130 mmol/l while 78 (60%) patients had potassium level >130 mmol/l. (Figure 3)

DISCUSSION
Worldwide, diarrhea is one of the most common life threatening disorders among children having ages up to 5 years. Acute diarrhea can lead to severe morbidity and even mortality if early and proper management didn’t provided. Many of complication associated with diarrhea, in which sodium and potassium abnormalities are commonly found and these complications may lead to higher rate of morbidity and mortality [10-11].

In developing countries, diarrheal diseases are a major cause of morbidity and mortality. If they aren't breastfed, infants are more likely to get gastroenteritis than if they are. Unhygienic feeding practices and malnutrition are also risk factors for gastroenteritis development. When it comes to gastroenteritis, young children are especially
vulnerable because of their large body surfaces, which cause them to lose water at a faster rate. Because of the higher water content, these children are more likely to develop an electrolyte imbalance [12]. We conducted this study with aimed to determine the sodium and potassium abnormalities such as hyponatremia and hypokalemia in children with acute diarrhea. In this regard 130 patients of either gender were examined. Majority 72 (55.38%) were males while 58 (44.62%) patients were females. Mean age was 2.38±1.52 years and majority 65% were ages 1 to 3 years. These results were comparable to many of previous studies in which male patients were high in numbers 60% to 70% and the average age of patients was 2 years [13-14]. Mean disease duration was 3.54±1.33 days. 70 (53.85%) patients had urban residence while 60 (46.15%) had rural residency. 40 (30.77%) patients had low socio-economic status, 60 (46.15%) had middle and 30 (23.08%) had high socio-economic status.

In present study we found that all patients had loose motion 130 (100%), 90 (69.23%) patients had abdominal pain, 45 (34.62%) had fever, 38 (29.23%) patients had vomiting, and 35 (26.92%) had lethargy. Previous studies demonstrated that after loose motion abdominal pain, fever, and vomiting were the frequently found clinical presentation [12, 15].

In our study, we found that 40 (30.77%) patients had serum sodium level <3.5 mmo/L (hyponatremia) while 90 (69.23%) patients had serum sodium level in normal range. Hypokalemia was observed in 52 (40%) patients with potassium level <130 mmol/L while 78 (60%) patients had potassium level >130 mmol/L. Sushil Kumar Bakolia et al [16] reported that out of 100 malnourished children with diarrhea, 15% patients had hyponatremia while hypokalemia was observed in 10% cases.

A study conducted in Bangladesh by Abu tayyab et al [17] reported that 32.8% children had serum sodium level <3.5 mmo/L and 43.2% patients had serum potassium level <130 mmol/L. An investigation carried out in Pakistan's Quetta found that out of 174 people suffering from acute diarrhoea, 43.7% had hyponatremia and only 5.7% had hyponatremia [18]. There were 41.6% of study participants with a sodium disorder (severe hyponatraemia with serum Na 120 meq/L. 23.6% with serum Na 120 meq/L at 135 meq/L, and 14% of hyponatremia with serum Na > 145 meq/L) according to an Iranian study. Hypokalaemia (serum K3.5 mmol/L) was found in 17.2% of the participants, while hyperkalaemia (serum K>5.5 mmol/L) was found in 3.7% of the participants.

Next to isonatremic dehydration, hyponatremic dehydration occurs more frequently in children who have taken diluted ORS. The history and clinical signs and symptoms may point to hyponatremic dehydration. More people being aware of ORS preparation could help reduce the incidence of AGE-related hyponatremia [19].

CONCLUSION

Sodium and potassium abnormalities are very common in children with acute diarrhea and can lead to high rate of morbidity and mortality. We concluded that frequency of hyponatremia and hypokalemia were very high in children with acute diarrhea.

REFERENCES