Malaria is one of the highly prevalent parasitic infections with high number of fatal outcomes still in this era of scientific advancement and potentially being a treatable disease it is one of the leading causes of death [1].

According to the latest World malaria report, there were 247 million cases of malaria in 2021 compared to 245 million cases in 2020. The estimated number of malaria deaths stood at 619,000 in 2021 compared to 625,000 in 2020 [2].

Pakistan also bears major burden of disease, 305 million cases registered last year. It is one of the endemic countries for malaria, with very high risk of transmission almost every person is at risk for getting the disease [3, 4].

In our country, *Plasmodium vivax* is extensively common, ranged from 70% to 81% followed by *Plasmodium falciparum* and very little contribution from other *plasmodium* variants [5, 6]. Traditionally, *Plasmodium vivax* is thought to be a benign disease as parallel to falciparum but since last few years more troublesome and even lethal outcomes are being noted [7].

*Plasmodium* is affected by many factors including climate. In Pakistan, KPK is worst malaria affected area followed by Sindh [8]. Knowledge is required about genetic makeup, disease producing properties qualities clinical presentation and drug response of the locally prevalent *plasmodium* species for proper control of disease, unfortunately scanty literature is available [6]. Research on these parameters is the need of...
time. Recently Pakistan was hit by troublesome floods, apart from mass destruction and human losses it also became the reason for dramatic increase in infectious disease including malaria [9]. We conducted this study to access whether there was only increase in no of patients or clinical variance is also there.

**M E T H O D S**

This cross-sectional study was conducted at a premier tertiary care hospital i.e. Liaquat University of Medical & Health Sciences, Jamshoro which is represented hospital of whole interior of Sindh. The study was approved from the Research Ethics Committee of Liaquat University of Medical & Health Sciences, Jamshoro (Letter No./REC/-174; Dated 08-11-2022). The patients were selected via non-probability convenience sampling. Sample size was calculated via WHO Open Epi software by taking prevalence of *P. vivax* in patients with severe malaria as 12.7% with Margin of Error as 5% and Confidence Interval of 95% [6]. All patients of age more than 13 years, irrespective of gender differences who were either admitted in medical ward or seeking consultation from in Medical OPD with positive report of *P. vivax* malaria were included in the study. Patients who were co-infected with *Plasmodium falciparum*, dengue or ITP were excluded from the study. *Plasmodium vivax* was detected by Giemsa stain, thick and thin blood films or ICT Malaria. Data were recorded on predesigned proforma after written informed consent from participants. The proforma included demographic profile, history, general and systemic examination of the patients along with lab investigations. Complete blood count, random blood sugar, (BSR), liver function test, urea, creatinine, serum bicarbonate, urine examination, other specific tests were done as per clinical judgment with an intent of treatment. Severity of malaria was determined according to the classification criteria established by CDC [10]. The duration of study lasted from November 2022 to April 2023 and the data were analyzed with the help of SPSS version 23.0.

**R E S U L T S**

Total 170 patients were enrolled both from medical wards and OPD, who fulfilled the inclusion and exclusion criteria. In our study male were 47.6% while female were 52.4%. Age ranged from 13 years to 85 years so mean age was 26.6 year. Out of these 170 patients 50.6% patients of *Plasmodium vivax* found to be suffered from severe malaria (Figure 1). Severe anemia, ALOC and jaundice were present in 28.2%, 21.2% and 11.2% of patients and the criteria of severe malaria present in selected patients showed in Table 1.

Hemoglobin (g/dl) distribution and Platelet Count of the patients was shown in table 2. Minimum platelet count was $12 \times 10^9/L$ and Maximum was $358 \times 10^9/L$ while mean value was $64.6882 \times 10^9/L$ (Table 2).

Table 2: Hematological Parameters among patients of *P. vivax* Malaria

<table>
<thead>
<tr>
<th>Hematological Parameters</th>
<th>N (%)</th>
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<tbody>
<tr>
<td>Less than 7 g/dL</td>
<td>48 (28.2)</td>
</tr>
<tr>
<td>7.1 to 10 g/dL</td>
<td>69 (40.6)</td>
</tr>
<tr>
<td>Greater than 10 g/dL</td>
<td>53 (31.2)</td>
</tr>
</tbody>
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**D I S C U S S I O N**

Malaria is one of the widely spread, vector bond infectious disease responsible for grave health issues [11]. Malaria can manifest itself from inconspicuous infection to severe malaria which may be life threatening. Once assumed to be an innocent disease *P. vivax* is now increasingly being documented as an important cause of severe malaria [12, 13]. We conducted this study to access post flood situation of vivax malaria, whether there were only increases in the number of *P. vivax* malaria cases or variation in clinical spectrum of the disease was also there. In Pakistan, Sindh was tremendously hit province by floods. Apart from other
failure in 30% [21]. Hypoglycemia (i.e., less than 40 mg/dL), in one study our study, where we found no patient with significant thrombocytopenia are HGF and IL induced thrombocytopenia other important inuencer of levels of IL-10 which is also responsible for severity is strongly connected with the production of high mediators, leads to endothelial activation, resulting in worsening of the disease. P. vivax infections disease severity is strongly connected with the production of high levels of IL-10 which is also responsible for P. vivax induced thrombocytopenia other important influencer of thrombocytopenia are HGF and IL-1Ra [20]. In contrast to our study, where we found no patient with significant hypoglycemia (i.e., less than 40 mg/dL), in one study authors found hypoglycemia in 48%, and liver and kidney failure in 30% [21].

C O N C L U S I O N S
It is noted that younger age people were affected more from P. vivax and an enormous number of P. vivax positive patients manifested as severe malaria cases with anemia and thrombocytopenia as common comorbid findings. Healthcare awareness regarding the elimination of the hypnozoite stage, and implement rigorous vector control measures for disease prevention should be promoted.

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