LANDSCAPE OF SOMATIC MUTATIONS OF MYELOPROLIFERATIVE NEOPLASMS IN PAKISTANI PATIENTS

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Objective

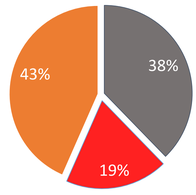
This study aimed to screen myeloproliferative neoplasm (MPN) patients for four known genetic mutations after their clinical and bone marrow examinations to establish a diagnosis before treatment.

Method

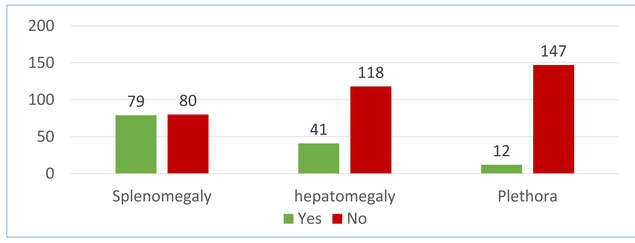
This descriptive cross-sectional study was conducted at the Armed forces bone marrow transplant center, Rawalpindi (AFBMTC), between January 2018 and January 2021. A total of 159 MPN patients who fulfilled inclusion criteria were enrolled. All patients underwent bone marrow biopsy after providing informed consent, history recording, and examination. Peripheral blood samples were screened for somatic mutations in JAK2 V617F, JAK2 exon 12, CALR, and cMPL genes. The JAK2 V617F and cMPL mutations were analyzed using conventional PCR, and the PCR products were analyzed on polyacrylamide gel electrophoresis (PAGE). JAK2 Exon 12 and CALR mutations were analyzed using the fragment analysis technique. Positive and negative controls were run with each sample. The final results were analyzed using Gene Mapper 5 Software (Applied Biosystems). The gene scan data was interpreted by analyzing the electropherograms and the genotyping data sheet. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25.0.

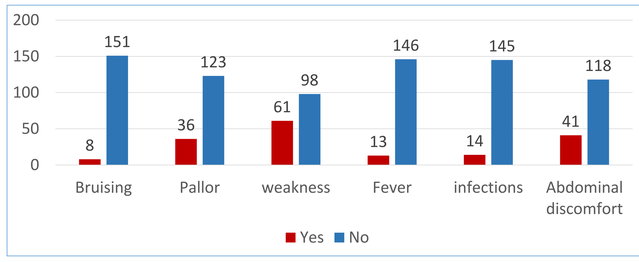
Results

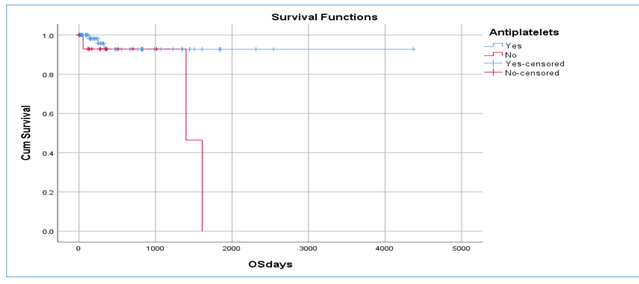
A total of 159 MPN patients fulfilled the inclusion criteria, with 104 (65.4%) males and 55 (34.6%) females. The median age of patients was 54 years (IQR: 38-64). Among Philadelphia negative (Ph-ive) MPN patients, 69 (43.4%) were diagnosed with primary myelofibrosis (PMF), 60 (37.7%) as polycythemia vera (PV), and 30 (18.9%) as essential thrombocytosis (ET). The frequency of the JAK2 V617F mutation in PV, ET, and PMF patients was 85%, 51.4%, and 34.5%, respectively. CALR mutation was observed only in 1 PMF and 5 (17.2%) ET patients. Additionally, cMPL mutation was not found among our patients. However, 14 (8.8%) patients were triple negative (negative for the JAK2 V617F, CALR, and cMPL mutations).

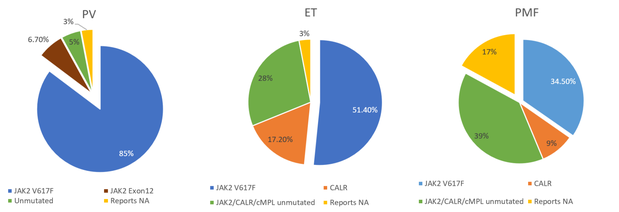


MPN Patient Characteristics
Age Range = 15 – 78 years
Median Age= 54 years









Management Details				
Treatment	Cytoreduction	Yes	83	52.2%
		No	76	47.8%
	JAK2 inhibition	Yes	9	5.7%
		No	150	94.3%
	Antiplatelets	Yes	123	77.4%
		No	36	22.6%

Conclusion

PMF was the most frequent (43.4%) condition among Ph-ive MPN patients, followed by PV (60, 37.7%) and ET (30, 18.9%). The frequency of JAK2 V617F mutation in PV, ET, and PMF patients was 85%, 51.4%, and 34.5%, respectively. CALR mutation was observed only in 5 (17.2%) ET and 1 PMF patient. These five mutations are among the diagnostic criteria established by the World Health Organization, which enable a quick and reliable diagnosis of MPN.

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