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Research Article

Study the Causes of the Spread of a Disease Polycythemia Rubra Vera, (PRV) In the Youth Stage, It is Reflected in Heart Diseases, Blood Pressure and Increased Hemoglobin

DR. SALAH ABD-AL KADER OMRAN[1*]
[1*]M. Phil. Med. Cardiologist, Al-Muthanna University, College of Medicine, Iraq.
Email ID: drsalahomran@yahoo.com
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ABSTRACT
Applied academic work, We randomly collected the largest number of patients, men and women of different ages, 730 patients at an age greater than 25 years to treat and search for the real causes and to reduce the factors of the prevalence of polycythemia in Iraq / Samawah city, patients and reviewers, especially at young age, we collected from the files, history, patients and reviewers Outpatient clinics Al Samawa Teaching Hospital, and the private clinic, we relied on clinical diagnosis, laboratory, and x-rays, taking a sample of the bone marrow, the patient's complaint and suffering, the patient's external form, assessment of his condition, and the slow disease march for many years with (PV), and we have made arrangement for patients: 1) The first end point Age (25-40) Young people whom we treat primarily receive treatment and all treatment requirements for the stage according to the schedule of reviews and the special file for each patient and are committed to complete treatment for them, while the percentage is 85% in safety, while the2) second end point which includes over 40 Year of polycythemia (PV) who suffer from cardiovascular risk factors patients who are ready for heart diseases, blood vessels, stroke, coronary syndrome and Ischemic attacks, or pulmonary embolism, thrombosis of the veins and arteries, and increased blood viscosity due to the disease More redness and advanced age require more curative care) in addition to polycythemia disease requires intensive care and the provision of all treatments. For heart diseases, chronic diseases and strokes that occur in different parts of the body, and the maintenance of patients was a maximum of 40% in safety. As for the 3) third end point that we cannot predict, the disease develops outside the scope of medical work and after a period of more than 15 years, cancer (leukemia, myeloprolifrative disorder, mellodysplasia, cirrhosis leaver, splenomegaly), The patient must be admitted to the hospitalization immediately and given chemotherapy and intensive follow-up because the side effects threaten the patient's life with death. The safety rate is 15%. We have divided us in terms of scientific and practical results and daily observations into groups☐
I th Group: Young ages (25 - 40 years) "Randomized, Primary (PV), high HGB,HCT, WBC, platelet = 480 patient (72.3%), phlebotomy = (76.1%), (2.9 %) low HCT, Hazard ratio HCT = (12%), Incident of death = (0,1 %), Rat death = (0, 0001%), percentage thrombosis arterial and vines risk = (2.4%) According to the blood viscosity and (factor obesity), CI (confidence interval arterial and vines = 1.8 %). RDW = high > 0.1 FI (Increased forms of red blood cells from the bone marrow), JKt2 = + (92%), EPO = Low☐
II Group: Ages (over 40 years old) are randomized (PV) 350 patient "Randomized. The major causes of morbidity and mortality, Are various heart diseases, chronic diseases that the patient suffers from, risk factors and age JKt 2 = + (65%), High HGB, HCT, WBC, platelet = (70%), phlebotomy = (35%), thrombosis artery or vanes = (9.7%), EPO = Low), Rat death = (4.2%), (2.6) female HCT Low, hazard rate HGB, HCT, WBC, platelet = (9.3 %), Incident of death = (9.8 %), heart disease = (65%). chronic disease = (75%)☐
III Group: Develop disease 4% patient (Myeloproliferative disorder, leukemia, Carcinoma, Other tumors'), Chemotherapy should be taken as quickly as possible even with treatment, and here plays the role of genetics, genetic mutations JAK2 V617F -, sex, conditions around humans, the nature of food, radiation, and environmental pollution that causes disease and live in high altitude. Our goal is to protect patients from vascular thrombosis among the main causes For death for patients with polycythemia vera (PV). All studies and research are promising to affect the gene that causes the genetic mutations of the disease and its suppression, These findings suggest a direct link between myeloproliferation and thrombogenesis in PV, which is likely to provide new opportunities for targeted antithrombotic interventions aimed at decreasing PV-related morbidity and mortality.
Objective / Purpose
Searching for the true clinical causes of polycythemia in various ages, especially young people.. Reducing the actual contribution and removing the risk of death from them and raising the harm to people from side effects.. Delaying and searching for the genetic mutation in the development of polycythemia vera.

Keywords: Patients, Pathological Analyzes, Therapeutic Drugs, Risk Factors, Clinical Diagnosis, Modern Radiological Devices, Electrocardiogram, Cardiac Catheters, Chemotherapy.

INTRODUCTION

Polycythemia It is a Greek word meaning" a lot (Increase) cells (Red blood cells) blood stream (Blood plasma), In the recent period, it has spread significantly in Iraq / Samawah - Polycythemia rubra vera (PRV) [1,2] (primary proliferative polycythemia) in the youth stage more than 25 years old, due to additional reasons such as pollution, fuel oil, gasoline, smoking (tobacco), war residues, the use of radioactive weapons and the use of chemical pesticides, which negatively affected the environment surrounding the human being, from The most prominent cases in the academic educational hospital / department of internal medicine Polycythemia rubra vera (PRV), the most prevalent of Patient history and patient reviews of the hospital and the outpatient clinic, and consultations - to present scientific research, namely:

True polycythemia (polycythemia rubra vera) * Myeloproliferative disorder) [3,4,5] is a slow-growing leukemia in which the bone marrow produces too many red blood cells. These extra cells cause the blood to thicken, to slow its flow. It also leads to complications, such as blood clots, that can lead to a heart attack or stroke. (*PRV) occurs in 2 per 100,000 people, no age group spared for adults and increases with age to rates up to 18 / 100,000. Family transmission occurs but is rare. A slight general dominance was observed for males, but women dominate within the reproductive age group ", but its spread in our country gives importance and observation, especially in the youth stage ;" This disease is discovered when analyzing the blood of the patient[18,19,20] (CBC (Complete blood count). We notice HCT or PCV Hematatacret which means (the percentage of red blood cells in the sample) and is measured by the normal percentage in men (42% - 52%) and women (37% - 47%) And children (36% - 44%) and this percentage is not fixed with all people, according to the analysis, laboratory, and units of measurement in effect. These hematocrits are when they decrease and when they increase: -

I) (HCT) or (PCV) * reduced in anemia, in case of bleeding, malnutrition, bone marrow failure, hemodialysis (delis blood), rheumatism, leukemia.

II) Increased hematocrit HCT or PCV * in polycystic cases Bone marrow produces large quantities of red blood cells secreting the bone marrow more than the body needs him so the increase appears RBC, and Hemoglobin (hemoglobin blood protein that carries oxygen to the cells of the body), and increase HCT or PCV Which is called PRV polycythemia[8,9,10], which we will focus our research which is (Primary), which is divided according to scientific references and the World Health Organization for myeloproliferative diseases as follows:

The first stage: The problems that appear on the patient increase the production of blood leads to an increase in the size of the spleen,[6,7] because the spleen is stored to break the red, excessive, pyramidal and abnormal blood cells and rid the body of the excess from the normal, with the increase in the size of the liver, so the patient appears flatulence due to inflation with the vomiting of the patient.

The second stage: persistent headache, high blood pressure, especially diastolic pressure, with tinnitus in the ear with a patient imbalance.[17]

The third stage: the patient feels itchy skin without a medical skin cause (increased hemoglobin due to histamine secretion). The increased hematocrit (HCT) is more than 60% or 70% in patients and more.

The fourth stage: clots in the upper and lower extremities, and heart attacks, and this occurs every 2/100000, and adequate treatment and taking the blood withdrawal (**Venesection)** from the patient is 500 hours according to the case and the age of the patient or do (Bleeding capping) (method of drawing blood from the skin) and it is preferred to organize Bone marrow, [16],

Real polycythemia is one of a group of slow blood cancers known as myelogenous tumors. And infection occurs when a mutation in a gene causes a problem in the production of blood cells. Usually, the human body in the blood regulates a number of three types of blood cells.. which are red blood cells, white blood cells and platelets, but in true red polycytes the bone marrow has a lot of Some blood cells, scientific references and scientific research confirm, according to the World Health Organization's classification of chronic myelogenous diseases, [14,15] that the main cause is not known exactly, and it is believed and confirmed that the mutation that causes true polycythemia affects the key to the protein that commands the cells to grow, and it is specifically a mutation in Protein kanase protein 2 (JAK2) Mutations (changes) to the JAK2 gene are the main cause of the disease. an abnormal karyotype. What we want to demonstrate is the effect of the disease, the primary polycythemia and its apparent relationship to the cardiovascular system and the diseases associated with it. And reduce it in the prevention and treatment and how to deal with it.. And provide the optimal solution from our clinical work and discreet scientific sources supporting the curbing of this disease. [11,12,13]

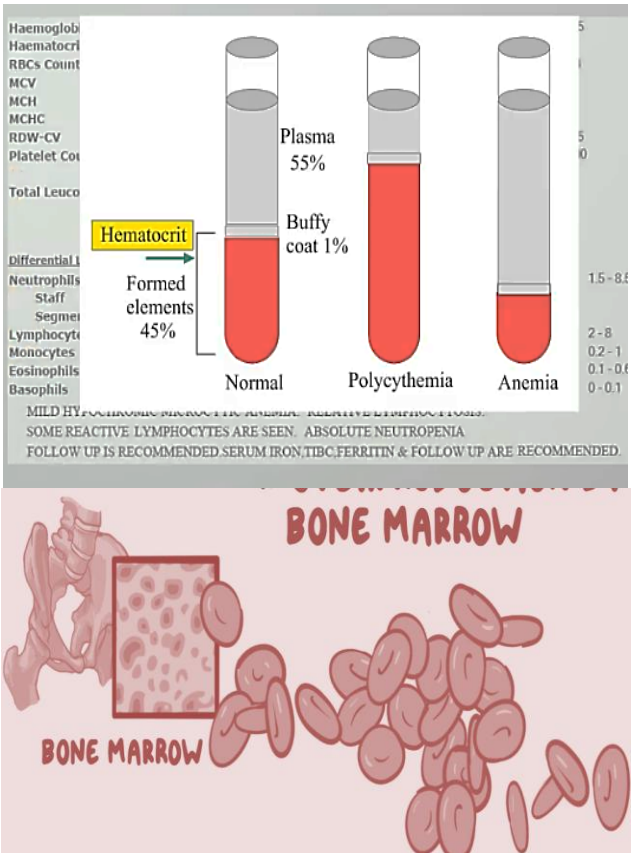


Fig.1: The process of blood deposition in the centrifuge

Table 1: Normal complete blood count results for adults

1.	Red blood cell count (RBC)	(**Male: (4.32-5.72million cells/mcL Female: (3.90-5.03 million cells/mcL)
2.	Hemoglobin (HGB)	(**Male: 13.2-16.6 grams/Dl Female: 11.6-15 grams/dL
3.	Hematocrit (HCT)	Male: 38.3-48.6 percent Female: 35.5-44.9 percent
4.	White blood cell count (WBC)	(3,400 to 9,600 cells/mcL)
5.	Platelet count	Male: (135,000 to 317,000/mcL) Female: (157,000-371,000/mcL)
6.	Mean corpuscular volume (MCV)	80 to 100 femtoliters
7.	Mean corpuscular hemoglobin (MCH)	27 to 32 pictograms
8.	Mean corpuscular hemoglobin concentration (MCHC)	Normal range is 32% to 36%.
9.	Mean Platelet Volume (MPV)	8.9 to 11.8 fL (femtoliters).
10.	Red cell distribution width (RDW)	M: 11.8 to 14.5 % percent in adult males F: 12.2 to 16.1% percent in adult.

* L = liter,** mcL = microliter, dL = deciliter *** (Mayo Clinic In Florida 2020)

MATERIALS AND METHOD

The research was carried out directly to the patients reviewed in the outpatient clinics, consultants and auditors of the Samawah Teaching Hospital / Diabetes and Endocrine Specialized Center in Iraq.. In light of the basic data for the diagnosis and the increase in the number of injured and clinical work, symptoms and signs, patient complaints and evaluation of the patient history and the diseases associated with it where they were collected The number of sick and associated diseases was sorted 730 patients randomly, women, men and different ages of 25 years and older, for a period of 15 months (2019-2020)... The focus was on the observed increase in polycythemia, especially in the youth stage, which is rare according to scientific statistics and scientific references, until we addressed their lives, traditions, nutritional habits and risk factors surrounding them for the definite knowledge of curbing and reducing disease. We started with analyzes related to blood

and cardiovascular system diseases." Complete blood count (CBC).. RBC. Hematocrit, platelet. Hemoglobin, WBC, Reteclacyt... ect), F.B.S, Hb1C, C.R.P, R.F.T, Lipid profile, Uric acid, (Bone marrow Biopsy), Blood film, JAK2 V617F (Janus kinase 2) (JAK2 V617F and exon 12 mutations), Usually to distinguish polycythemia vera from secondary polycythemia, as EPO levels are not affected., Ferritin, BP, Ultra sound, Doppler, Alt, Ast. Cardiac enzyme troponin..), k.p,k –MB, (Genetic test), ECG, Echo, halter, chest-x-ray, CT, (BT, PT, PTT, INR), Electrolytes..(T3. T4.TSH).While working, we focused on these main analyzes and patient follow-up: (Masked PV, overt PV) RBC, HGB. HCT, PLT,..) And the dimensions of the risk of death and the side effects of treatment and prevention For the initial cases that were recorded for different patients, which is the, The first end point for us.. As for the second end point, patients who are ready for heart diseases, blood vessels, stroke, coronary syndrome and ischemic attacks, or pulmonary embolism, thrombosis of the veins and arteries, and increased blood viscosity due to the disease More redness and advanced age require more curative care.. As for the third end point of the disease progression due to leukemia and progression to Cirrhosis or during myelodysplasia or transformation to leukemia.. And the large bleeding that requires hospitalization immediately, So the work was in-depth according to the first group division: the youth stage from 25 - 40 years in a random manner, especially redness, platelets, hematocrit, white blood cells increase, and increased blood viscosity. The patient notes redness of the face, dizziness and increased pressure the unjustified follow-up and coronary arterial monitoring, in addition to clinical tests, early review and diagnosis, is important in following up the patient by drawing blood from the patient -250--500C and according to the patient's situation intravenously and a dose of aspirin and an anti-histamine and aloperinol as there is an increase in the uric acid (gout) and according to the patient's complaint and review The patient according to the schedule of hospital reviews to maintain the patient's health and keep away the risk factors... and their lives are completely normal 85% in safety and keep away the occurrence of death.. As for the second end, the second group of patients: over 40 years of age who have risk factors in addition to polycythemia (written in full in the paper). Therefore, follow-up is more and more concerned with the dimensions of risk factors in the medicine and food, and for Life style, and by being intravenous monitoring and follow-up of blood tests and their health status under treatment and they are 40%. In safety.. As for the patients, the third end. The third end: who developed the disease in them. We cannot predict that we can try to keep this stage out of cancer (leukemia, Myelofibrosis, --) and take chemotherapy and clinical and laboratory follow-up because they are threatening their lives with death... while working in Treatment to reduce the risk of complications and disease progression was used according to the FDA's US protocol:

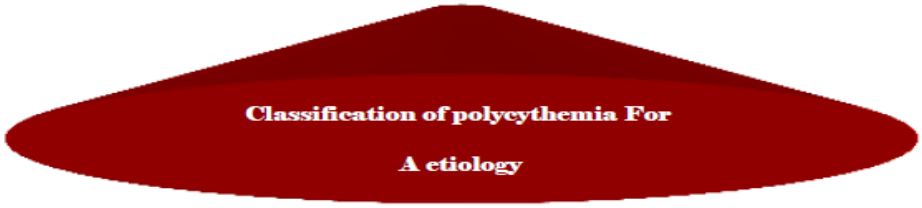
1. A reduced dose of aspirin, or plavix (to prevent blood clots.
2. To reduce itching, antihistamine and anti-serotene. (SSRis)
3. To reduce the increase in blood by intravenous withdrawal by venous check-up.
4. Hydroxyurea, Droxia to inhibit the bone marrow's ability to produce blood cells.
5. Intro A Interferon -2b)) to stimulate the immune system to fight excessive blood cell production.
6. Ruxolitinib (Jakafi) is a drug for the destruction of cancerous cells in patients with polycythemia.

What we want to show is that the genetic mutation (JAK2 positive) is a low hormone (ETO) and that R.B.C, HGB, HCT, Plt) Within the normal limits as shown in (fig--) in the first end point, the second point is added Cardiovascular system risk factors and thrombosis require hospitalization, **I th Group**: Young ages (25 - 40 years) "Randomized, Primary (PV) high HGB,HCT, WBC, platelet = 480 patient (72.3%), phlebotomy = (76.1%), (2.9 %) low HCT, Hazard ratio HCT = (12%), Incident of death = (0,1 %), Rat death = (0, 0001%), percentage thrombosis arterial and vines risk = (2.4%) According to the blood viscosity and (factor obesity), CI (confidence interval arterial and vines = 1.8 %). RDW = high > 0.1 FI (Increased forms of red blood cells from the bone marrow), JKt2 = + (92%), EPO = Low. **II Group**: Ages (over 40 years old) are randomized (PV) 350 patient "Randomized. The major causes of morbidity and mortality, Are various heart diseases, chronic diseases that the patient suffers from, risk factors and age JKt 2 = + (65%), High HGB, HCT, WBC, platelet = (70%), phlebotomy = (35%), thrombosis artery or vanes = (9.7%), EPO = Low), Rat death = (4.2%), (2.6) female HCT Low, hazard rate HGB, HCT, WBC, platelet = (9.3 %), Incident of death = (9.8 %), heart disease = (65%). chronic disease = (75%). **III Group**: Develop disease 4% patient (Myeloproliferative disorder, leukemia, Carcinoma, Other tumours), must be taken for chemotherapy possible even with treatment, Here, you play the role of heredity, genetic mutations, gender, the conditions surrounding humans, the nature of food, radiation, and environmental pollution that are the cause of disease .All studies and research are promising to affect and inhibit the gene that causes the genetic mutations of the disease.

Absolute polycythemia: There are 2 main types:*

- Primary polycythemia – there's a problem in the cells produced by the bone marrow that become red blood cells; the most common type is known as polycythemia Vera (PV). also have abnormally high numbers of both platelets and white bloods cells
- Secondary polycythemia – too many red blood cells are produced as the result of an underlying condition.

Table 2

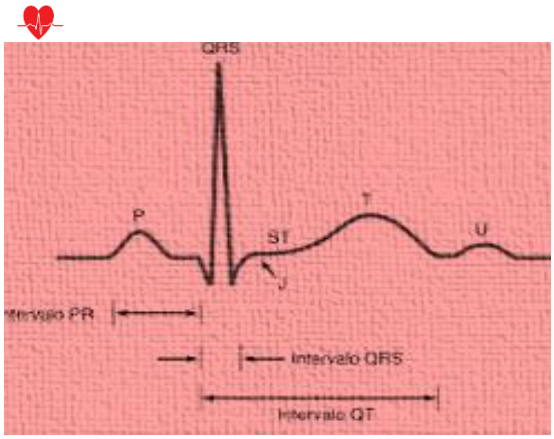


Causes of True polycythemia

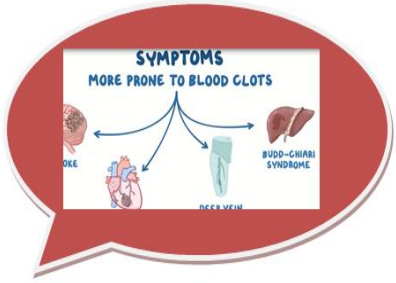
A Etiology	Example
1) Primary : Myeloprolifrative disorder (P.M.D) .	1) Polycythaemia Rubra Vera (primary poliferative polycythemia) (* P.R.V)
Secondary : Increased* EPO •Due to tissue hypoxia .	2) High a ltitude. • Lung disease. • Cyanotic heart disease. • High – affinity haemoglobins .
3) Inappropriately increased EPO Renal disease .	3) (Hydronephrosis • Cysts. • Carcinoma • Other tumours • Hepatoma. • Bronchogenic. • Uterine fibroids. • Phaeochromocytoma. • Cerebellar or haemangioblastoma .

MPN: Myeloproliferative neoplasms, ET: essential thrombocythemia, IMF: idiopathic myelofibrosis, PMF: primary myelofibrosis, Polycythemia vera (PV) is currently classified by the World Health Organization(WHO) classification system

Polycythemia (PV) Electrocardiogram ECG



And Height of the QRS >120 ms, p < 0.01 dispersion difference between (P min and p max) As if the effort on the atrium heart, As for (Q-T interval) Prolong > 370 ±15 و T wave increase of both (T peak –T end), As for the patients who have additional risk factors, the majority appear after 40 years of heart After we collected and analyzed the results for ECG 12-lead electrocardiographs (ECG) patients a useful tool for predicting both atrial and ventricular arrhythmias via measurements of P and QT waveforms, QRS and its derivatives. Polycythemia vera (PV) is a chronic myeloproliferative disorder associated with cardiovascular events. It has been observed in young adults that there is a slight disorder in the depolarization and repolarization and with tachycardia and lung diseases. T-Inverting, p expansion, high QRS hypertrophy, ST height characteristic broad-based morphology appear complete coronary artery occlusion and can be the earliest ECG signature of ST elevation myocardial infarction. (Q-T interval) Prolong 380 <± 32 in the PV group was independent of age, BMI, diabetes and hypertension, gender, systolic blood pressure, hemoglobin, hematocrit, left atrial dimension, left ventricular end-diastolic diameter and early deceleration time in a univariate analysis of co-variance model, Conclusion: The current study showed that PV may be associated with electrocardiogram abnormalities for both the atrium and ventricle .



Emergency Medical Advice

Polycythemia can cause blood clots- These put you at risk of life-threatening problems such as: 1) deep vein thrombosis (DVT) – a blockage that forms in the blood vessels in your leg before moving elsewhere in your body. 2) pulmonary embolisms – a blockage in the blood vessel that carries blood from the heart to the lungs, pigmentation the leg. Mayo Clinic Marketplace.

RESULTS

	Group	Results
1.	I th Group	Young ages (25 - 40 years) "Randomized, Primary (PV) high HGB, HCT, WBC, platelet = 480 patient (72.3%), phlebotomy = (76.1%), (2.9 %) low HCT, Hazard ratio HCT (12%), Incident of death = (0,1 %), Rat death = (0, 0001%), percentage thrombosis arterial and vines risk = (2.4%) According to the blood viscosity and (factor obesity), CI (confidence interval arterial and vines = 1.8 %). RDW = high > 0.1 FI (Increased forms of red blood cells from the bone marrow), JKt2 = (92%), EPO = Low.
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3	III Group	Develop disease 4% patient (Myeloproliferative disorder, leukemia, Carcinoma, Other tumours), must be taken for chemotherapy possible even with treatment, Here, you play the role of heredity, genetic mutations, gender, the conditions surrounding humans, the nature of food, radiation, and environmental pollution that are the cause of disease. All studies and research are promising to affect and inhibit the gene that causes the genetic mutations of the disease

DISCUSSION

From the clinical aspects, we discuss the cause of uncontrolled erythrocytosis and non-viscosity, leading to neurological symptoms such as vertigo, tinnitus, headache, visual disturbances and transient ischemic attacks (TIAs). Diastolic hypertension is also a feature of high red cell mass. In some patients, venous or arterial thrombosis may be the manifestation of PV manifestations. Any vessel can be affected, but the cerebral, cardiovascular or mesenteric vessels are most affected. Venous thrombosis inside the abdomen and various places is particularly common among young women and may be disastrous if a sudden and complete blockage of the hepatic vein occurs. Indeed, PV should be suspected in any patient with thrombosis of the hepatic veins. Digital ischemia, bruising easily, nosebleeds, gastrointestinal disease, or gastrointestinal bleeding may occur due to stagnation of blood vessels or thrombocytopenia. Erythema, burning, and pain in the extremities, a symptomatic complex known as erythromelalgia, is another complication of thrombocytopenia from PV. Due to the major transformation of hematopoietic cells, hyperuricemia with secondary gout, uric acid stones, and symptoms caused by hyper metabolism can complicate this disorder. In addition to the risk factors and chronic diseases, Plasma erythropoietin level is a useful diagnostic test in patients with isolated Erythrocytosis, because high level excludes PV as a cause of erythrocytes.

Secondary causes of increased red blood cell mass (such as severe smoking, chronic lung disease, and kidney disease) are more common than polycythemia vera and should be excluded. Diagnosis is made using criteria established by the erythrocyte vera study group. Main criteria include high red blood cell mass, normal oxygen saturation, and pronounced splenomegaly. Untreated patients may survive for one to 24 months, while appropriate treatment may extend life expectancy of more than 10 years. We wanted to keep the advanced stage of the disease out and understand more so that myeloproliferative disorders and secondary polycythemia cover most cases of polycythemia encountered in daily practice. Inherited polycythemia are rare entities that must be suspected when excluding the classic causes of polycythemia acquired. We may not be able to speculate, but we were able to research a real addition in limiting its development and the occurrence of fatal complications of different ages, and recent studies promising it to affect the genetic mutations that cause the disease.

Table 3: (CBC) Characteristic of the patient analyze hematocrit baseline: PV

		Characteristic	High hematocrit	Low hematocrit	All patent N:730 M:460 F: 270	
1.		Age 25-70 yr Mal: % Female: %	Mal: 62% ± 9.2 Female: 6% ±2	Mal: 6% % ±2 Female:45.2 %±2	High M: 69% ±1 Low F: 45%± 1	
2.		Time from diagnoses to enrollment 0–2 yr — no. (%)	Under observation and information gathering	Under observation and information gathering	Collect and record the results	
3.		Hemoglobin — g/dl	M:35%±6 F:5%±2	M: 4% ± 3 F: 25% ± 4	High: M 39% ±3 Low: F 25% ±2	
4.		Platelet count — per mm3	M:445,000 F: 350,000	M: 390,000 ±10 F: 320,000 ±10	High: M 420,000 Low: F 325,000	
5.		Red-cell count — per mm3	M: 5,800,000 F:5,450.000	M: 5,600,000 F: 4,900.000	High: M 5,700.000 Low: F 5,300.000	
6.		White-cell count — per mm3	M: 10,000 F: 9600	M: 8.600 F: 7.200	High: 9200 Low: 8.300	
7.		Previous thrombotic events — no. (%) Arterial Venous	13% M: 22% F: 13% F: 14% M: 12%	9% M: 11% F: 9% F: 9% M: 7%	11% 15 F % High:15% F: 10% Low: 10% F: 11%	
8.		Previous hemorrhagic events — no. (%)	M: 2% F: 1%	M:1% F: 1%	High:1% Low 1%	
9.		Mutational status — no. (%) JAK2 V617F JAK2 exon 12	95% 1.5 %	95% 1.2%	95% 1.3 %	

CONCLUSION

We found the main point Thrombotic and cardiovascular events are among the leading causes of death for patients with polycythemia vera (PV), and the history of thrombosis is a major criterion for division of patient risk and treatment strategy. However, little is known about the mechanisms of blood clotting in patients who suffer From PV. This research is presented according to the most common complication during follow-up, which is coagulation., Age greater than 60 years and previous history of coagulation are the main risk factors for disease classes. An overview of the pathophysiology of coagulation in patients with PV and illustrates the roles of conventional and atypical coagulation risk factors, In addition to many traditional risk factors for thrombosis, clinical data indicate increased adhesion of hematocrit and red blood cells, active platelets, leukocytosis, and high JAK2V617F allele burden in patients with PV. Furthermore, inflammation associated with photovoltaic cells may aggravate blood clotting through various mechanisms, including endothelial damage, inhibition of natural anticoagulant pathways, and secretion of procoagulant factors. These findings suggest a direct link between myeloproliferation and thrombogenesis in PV, which is likely to provide new opportunities for targeted antithrombotic interventions aimed at decreasing PV-related morbidity and mortality.

Table 4: The percentage of patients taking Treatments for cardiovascular risk factors %

	Factor Risk	Patient percentage medication
1.	Hyperlipidemia	28%
2.	Antidiabetic medication	11%
3.	Antihypertensive medication	35%
4.	Antiplatelet agent	93%
5.	Aspirin	76%
6.	Plavix	12%
7.	Anti–vitamin K agent	4%

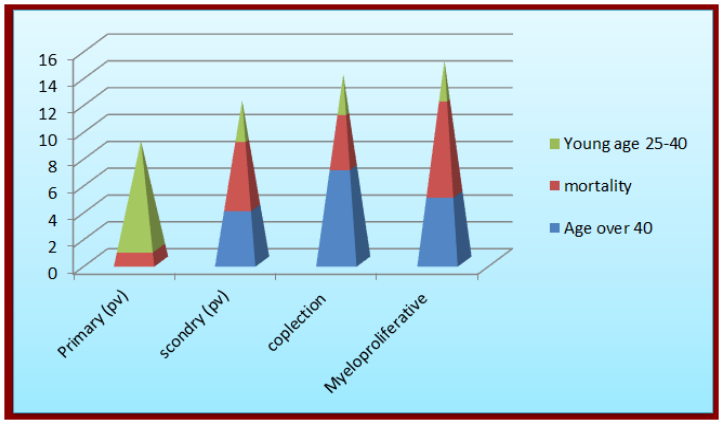

Diagram of polycythemia

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