Abstract: PB3269

Title: BLOODLETTING FOR RELIEF: A SYSTEMATIC EXPLORATION OF THERAPEUTIC PHLEBOTOMY'S IMPACT ON SYMPTOMATIC SECONDARY POLYCYTHEMIA IN THE ADULT POPULATION

Abstract Type: Publication Only

Topic: Iron metabolism, deficiency and overload

Background:

Secondary polycythemia (SP) is characterized by elevated production of red blood cells due to factors outside the bone marrow, such as chronic hypoxia. If left untreated, it often leads to a high viscosity of blood, resulting in complications such as thrombosis or stroke. The general treatment approach is to correct the underlying precipitating factors, but sometimes therapeutic phlebotomy (TP) has been utilized in treatment, especially for those with symptoms related to hyperviscosity.

Aims:

We present a systematic review assessing the effectiveness of TP in adult SP patients

Methods:

Following PRISMA guidelines, a comprehensive literature search was conducted on PubMed, Cochrane and ClinicalTrial.gov, using MeSH terms and keywords for "polycythemia, secondary" and "phlebotomy" in December 2023. Our search produced a total of 232 records and 15 original articles including case reports reporting therapeutic phlebotomy as a treatment for secondary polycythemia in adult patients were included for this systematic review. We analyzed the response to treatment both in terms of objective improvement in hematocrit as well as subjective improvement in symptoms. If the patients had complete resolution of symptoms with desired level of hematocrit, it was considered as complete response (CR) while with partial symptomatic improvement even after achieving desired hematocrit was considered partial response (PR).

Results:

A total of 93 patients from 15 articles were evaluated.**(Table 1)** The median age of participants was 60 years (35-75 Years), and 87.5% (70/80) were males. Most common cause of SP was COPD 85 (91%), followed by high altitude erythrocytosis 1(1%), interstitial lung disease (ILD) 1(1%), idiopathic pulmonary fibrosis (IPF) 1(1%), cyanotic congenital heart disease 1(1%), and polymyositis leading to low lung volumes 1(1%). Most common reported symptoms were dyspnea, confusion, headaches, exercise intolerance, suppression of hypothalamic– pituitary –testicular axis, chorea, and portal hypertensive gastropathy. Majority of the studies had a goal hematocrit of 45% to 55%. A total of 35% (33/93) patients achieved CR while 60% (56/93) achieved PR with the TP. 3% (3/93) of the patients had no improvement in symptoms even after reaching desired hematocrit levels. One patient (1%) died a week after TP due to respiratory issue

Summary/Conclusion:

This systematic review shows the safety and efficacy of therapeutic phlebotomy for the management of secondary polycythemia but considering limited data prospective large-scale studies are needed to consolidate these findings and to make concrete recommendations.

Table 1: Studies characteristics and clinical outcomes

Author, Year	Patient, n	Male n (%)	Median age, (years)	Underlying Disease n (%)	Post-phlebotomy hematocrit %	Pretreatment symptoms n (%)	Clinical Outcomes in Patients n (%)
Bhatia et al, 2022	10	8 (80)	56	COPD 5 (50), ILD 3 (30), IPF 1 (10), Post tubercular airway disease. 1 (10)	<52	Headache, visual disturbances, pruritis, weakness, fatigue, dizziness, skin redness 10 (100)	Statistically insignificant improvement in symptoms 10 (100).
Bornstein et al 1980	6	5 (83)	45	COPD 6 (100)	48.1 + - 2.62	Confusion neuropsychological symptoms 6 (100)	Improvement in cerebral function 6 (100)
Chetty et el 1983	13	NA	61	COPD 13 (100)	<55	Exercise intolerance 13 (100)	Improved exercise tolerance 13 (100)
Dayton et al 1997	11	10 (91)	62	COPD 11 (100)	<59	Dyspnea, headache, fatigue, nasal stiffness 11 (100)	Symptomatic improvement 8/11 (73)
Fuque et al 2021	1	1 (100)	60	COPD 1 (100)	54.8	Erythromelalgia, bleeding pruritis, LUQ pain 1 (100)	Erythromelalgia, pruritis, LUQ pain improved immediately after phlebotomy 1 (100)
Harrison et al 2017	10	8 (80)	60	Chronic bronchitis 10 (100)	> 47.89	Exercise intolerance 10 (100)	Improved exercise tolerance 7 (70)
Sri Prakash Misra et al 2004	1	1 (100)	75	Chronic bronchitis 1 (100)	45	Portal hypertensive gastropathy 1 (100)	Symptomatic improvement 1 (100)
Demetrios A. Patakas et al 1986	10	10 (100)	60	COPD 10 (100)	44.4 ± 2.2	Headaches and dizziness 10 (100)	Subjective improvement 10 (100).
Piccirillo et al 1994	1	1 (100)	67	COPD 1 (100)	53	Anginal symptoms 1 (100)	Anginal symptoms resolved 1 (100)
Hooman Salimipour et al 2015	1	1 (100)	35	Cyanotic congenital heart disease 1 (100)	58	Neurological symptoms dizziness, tingling, fatigue right and left hemiparesis, stiffness, chorea, and dystonic movement 1 (100)	Symptoms resolved at an Hct level (62.7%) 1 (100)
Semple, et al 1983	9	8 (89)	52	Chronic bronchitis 9 (100)	<52	Suppression of hypothalamus-pituitary-testicular axis 9 (100)	No improvement in hormonal profile 9 (100). Died of respiratory issues 1 (11) Subjective improvement 2 (22)
Torrez-Ramirez et al 2013	1	1 (100)	71	High altitude erythrocytosis 1 (100)	NA	Generalized chorea 1 (100)	CR of symptoms 1 (100)
Tripathy et al 2010	1	1 (100)	58	COPD 1 (100)	55	Respiratory failure, intubation, vent dependence 1 (100)	Early weaning and extubation 1 (100) CR of symptoms 1 (100)
Wade et al 1981	12	9 (75)	62	Chronic bronchitis 11 (92) Polymyositis induced lung disease 1 (8)	49	6 (50) were symptomatic including Headache 2 (17) & Confusion 4 (33)	CR of symptoms 6 (100)
York et al 1980	6	6 (100)	64	COPD 6 (100)	48	Dizziness, headache 6 (100)	Subjective improvement 6 (100)

COPD: chronic obstructive pulmonary disease, ILD: interstitial lung disease, IPF: idiopathic pulmonary fibrosis, Hct: hematocrit, CR: Complete resolution, Po2: Partial pressure of oxygen, Pco2: Partial pressure of carbon dioxide, ABG: Arterial blood gas, LUQ: Left upper quadrant, NA: not available.

Keywords: Erythrocytosis, Secondary, Therapy, Adult