STUDY OF SYMPTOMS AND SIGNS RELATED TO CARDIO-VASCULAR SYSTEM, ESPECIALLY CARDIAC MURMURS IN SEVERE ANAEMIA AND ITS REVERSIBILITY AFTER CORRECTION OF ANAEMIA

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ABSTRACT

BACKGROUND

Anaemia is one of the commonest clinical problems in our country. It affects various organs including heart. Clinical manifestations of anaemia referable to cardiovascular system may closely simulate symptoms and signs of organic heart disease, especially cardiac murmurs. The cardiac murmurs show either improvement or disappearance after correction of anaemia.

The aim of this study was to evaluate various clinical changes (symptoms and signs) related to cardiovascular system in patients of severe anaemia and their reversibility after treatment of anaemia.

MATERIALS AND METHODS

94 patients admitted in medicine wards in government general hospital, Solapur for severe anaemia (Hb concentration less than or equal to 7 gm%) were studied. Symptoms, general examinations signs and systemic examination signs related to cardiovascular system were assessed on admission. All patients were treated with deworming, iron therapy (oral or parenteral) or blood transfusion. All symptoms, general examination signs and systemic examination signs were reassessed after treatment.

RESULTS

1) Majority symptoms and signs related to cardiovascular system, in patients of severe anaemia were found in females. 2) 54 patients were having cardiac murmur, out of which 45 were females. 3) All symptoms and signs related to cardiovascular system were either improved or disappeared after treatment.

CONCLUSION

Patients with cardiac symptoms and or signs should be scrutinized for anaemia and treated accordingly especially females. Majority of these patients show disappearance of symptoms and signs after treatment.

KEYWORDS

Severe Anaemia, Haemoglobin Concentration, Cardiac Murmur, Wide Pulse Pressure, Correction of Anaemia.

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BACKGROUND

Anaemia is one of the commonest Clinical Problems in our Country-

Anaemia has Two Principle Effects-

1) A decrease in the amount of oxygen transported by each volume unit of blood, thus tending to produce tissue hypoxia, and
2) A decrease in blood viscosity associated with reduction in red cell mass.[1]

Most of the clinical features of anaemia are due to the consequences of diminished oxygen carrying power of the blood on the tissues and cardiovascular & ventilator adjustments to compensate decrease in red cell mass.

The clinical presentation depends upon the rapidity of the onset of anaemia, its severity, age of the patient and capacity of the cardiovascular system to adjust to it.[2] Anaemia affects various organs including heart. It is one of the commonest causes of hyperdynamic state of heart at rest.[3] Cardiac disturbances persist as long as anaemia is severe.[3] Quite strikingly the changes can be rapidly reverted by partial correction of anaemia.[4]

Clinical manifestations of anaemia referable to cardiovascular system may closely simulate symptoms and signs due to organic heart disease. On the other hand severe anaemia may precipitate or intensify heart failure or coronary insufficiency in presence of pre-existing cardiac or coronary disease. For this reason it is often necessary to diagnose and correct anaemia in order to evaluate the extent to which anaemia is partially or entirely responsible for the symptoms and signs.[5]

With reduced haemoglobin content of 25% or less, the blood volume is increased; there is generalised vascular

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dilatation in muscle and skin, rise in venous blood pressure and a high cardiac output with a degree of tachycardia.[6]

Symptoms and signs related to cardiovascular system like palpitation, dyspnoea, and oedema are usually direct result of anaemic state and outcome of heart failure especially elderly patients.[6]

MATERIALS AND METHODS-

Criteria for selection-

Male and female patients with haemoglobin equal to or less than 7 gm%.

Age - 15 years and above.

Criteria for Exclusion-

1. Recent history of major blood loss
2. Pre-existing heart disease like valvular heart disease, hypertensive heart disease, congenital heart disease, thyrotoxicosis
3. Systemic disorders which are likely to affect cardiorespiratory dynamics like renal failure, cor-pulmonale, tuberculosis and other respiratory diseases
4. Pregnancy
5. Presence of skeletal disorders or neuromuscular diseases which are likely to affect exercising capacity like kypho-scoliosis, polio-myelitis
6. Leukemias.

Clinical parameters studied were-

1. Symptoms – dyspnoea, palpitation, easy fatigability, fainting episodes, oedema, angina on effort, orthopnoea
2. General Examination Signs – tachycardia, tachypnoea, wide pulse pressure, raised JVP, pedal oedema
3. Cardiovascular examination signs – hyperdynamic apical impulse, murmur over precordium, and bruit over carotid.

All Patients are subjected to Treatment as-

1. Deworming.
2. Oral or parenteral iron therapy OR blood transfusion for correction of anaemia.

All the parameters are reassessed after increase in haemoglobin concentration by 3 – 5 gm %

Observations

Out of 94 patients 61 were females and 33 were males.

Haemoglobin concentration among these was 2-7 gram %.

Cardiovascular symptoms found in present study were easy fatiguability, dyspnoea on exertion, fainting episodes, palpitation, oedema over feet, orthopnoea and effort angina. Out of 61 females history of easy fatiguability was found in 51, dyspnoea on exertion in 43, Fainting episodes in 30, palpitation in 26, oedema over feet in 19, orthopnoea in 15 and effort angina in 11 female patients. Whereas out of 33 males history of easy fatiguability was found in 32, dyspnoea on exertion in 20, fainting episodes in 14, palpitation in 13 oedema over feet in 14, orthopnoea in 11 and effort angina in 8 patients.

Symptoms	Females	M ales	Total	%
Easy fatigability	51	32	83	88.29
Dyspnoea on exertion	43	20	63	67.02
Fainting episodes	30	14	44	46.08
Palpitation	26	13	39	41.48
Oedema over feet	19	14	33	35.10
Orthopnoea	15	11	26	27.65
Effort angina	11	08	19	20.21

Table 1. Cardiovascular Symptoms

General examination findings were assessed in all patients including temperature, pulse, blood pressure, respiratory rate, jugular venous pressure (JVP), oedema over feet, cyanosis, clubbing, icterus and lymphadenopathy. Positive findings were tachypnoea, tachycardia, wide pulse pressure, oedema over feet and raised JVP.

Out of 61 females, tachycardia was found in 16, tachypnoea in 45, wide pulse pressure in 27, pedal oedema in 26 and raised JVP in 21 patients. Whereas out of 33 male patients, tachycardia was found in 8, tachypnoea in 30, wide pulse pressure in 15, pedal oedema in 7 and raised JVP in 5 patients.

Signs	Females	Males	Total	%
Tachycardia	16	8	24	25.56
Tachypnoea	45	30	75	79.78
Wide pulse pressure	27	15	42	44.68
Pedal oedema	26	7	33	35.10
Raised JVP	21	5	26	27.65

Table 2. General Examination Findings Related to Cardiovascular System

On cardiovascular system examination positive findings found were hyperdynamic apical impulse, cardiac murmur and bruit over carotid. Out of 61 females hyper dynamic apical impulse was found in 26, cardiac murmur in 45 and bruit over carotid in 9 patients. Whereas out of 33 male patients hyperdynamic apical impulse was found in 13, carotid murmur in 9 and bruit over carotid in 5 patients.

Sl. No.	Signs	Females	Males	Total Patients
1	Hyperdynamic apical impulse	26	13	39
2	Cardiac murmur	45	09	54
3	Bruit over carotid	09	05	14

Table 3. Cardiovascular System Examination Findings

All Patients are given Treatment as-

1. Deworming – Mebendazole 1 bid for 3 days.
2. Oral or parenteral iron (IM OR IV infusion) or blood transfusion for correction of anaemia.

On an average, haemoglobin increased by 3-5 gm% after treatment.

All symptoms, general examination signs and systemic (cardiovascular) signs were either improved or disappeared after treatment.

All patients were subjected to 2 D echocardiography to exclude any organic heart disease.

DISCUSSION

In present study out of 94 patients of severe anaemia (Hb concentration equal to or less than 7 gm%), we have compared cardiovascular symptoms, general examination positive findings and cardiovascular examination positive findings among males and females.

In cardiovascular symptoms, easy fatiguability, oedema over feet, orthopnoea and effort angina were present more in males. Whereas dyspnoea on exertion and fainting episodes were present more in females.

Symptoms	Females in %	Males in %
Easy fatigability	83.60	96.90
Dyspnoea on exertion	70.40	60.60
Fainting episodes	49.10	42.40
Palpitation	42.60	39.39
Oedema over feet	31.10	42.40
Orthopnoea	24.50	33.33
Effort angina	18.03	24.20

Table 4. Comparison of Cardiovascular Symptoms in Males and Females

In general examination positive findings, tachypnoea was more in males, pedal oedema and raised JVP were more in females. Strikingly tachycardia and wide pulse pressure were nearly equal in both males and females.

Signs	Females in %	Males in %
Tachycardia	26.20	24.20
Tachypnoea	73.70	90.90
Wide pulse pressure	44.20	45.45
Pedal oedema	42.60	21.21
Raised JVP	34.40	15.10

Table 5. Comparison of General Examination Findings Related to Cardiovascular System in Males and Females

In positive findings on cardiovascular system examination, cardiac murmur and hyperdynamic apical impulse were more in females, whereas bruit over carotid was equal in both males and females.

Sl. No.	Signs	Females in %	Males in %
1	Hyperdynamic apical impulse	48.62	39.39
2	Cardiac murmur	73.77	27.27
3	Bruit over carotid	14.75	15.15

Table 6. Comparison of Positive Findings of Cardiovascular System Examination in Males and Females

Especially notable things are-

1. Wide pulse pressure narrowed by increasing diastolic blood pressure, systolic blood pressure not much changed.
2. 54 patients were having cardiac murmur. Out of these 54 patients, 45 were females.
3. Out of 54 patients showing cardiac murmur, 53 patients had systolic murmur (22 patients were having murmur only in pulmonary area and 32 were having it all over precordium) and only one had diastolic murmur.
4. After treatment out of those 54 patients, in 30 patients murmur disappeared. Remaining 24 patients showed reduced intensity of soft systolic murmur, that too only in pulmonary area.

In other study, heart murmurs are revealed in over 50% of children and adolescents, with a peak incidence between 8 to 12 years.[7]

Given the frequency of murmurs, doctors should know its characteristics so as to reduce reliance on sophisticated and expensive methods to recognize innocent murmurs.[8,9]

Most studies show dramatic clinical improvement with correction of anaemia.[10]

We have not considered the type of anaemia, duration of anaemia or bone marrow picture in the present study.

CONCLUSION

Severe anaemia can produce symptoms and signs related to cardiovascular system so as to suspect organic heart disease.

Especially females with severe anaemia show cardiac murmurs more commonly than males.

But after treatment and correction of anaemia (increase in Hb concentration by 3-5 %) the symptoms and signs show either improvement or disappearance.

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