

## A Case report of Anemia Masquerading as Myocardial infarction Unveiling Diagnostic Dilemmas in the Emergency Department

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### Abstract

44 Year old Male Presented to Er with Breathing difficulty, Sweating, altered mental status. Patient was tachypneic and Hypotensive and drowsy, Responding to painful stimuli. Patient blood gas analysis revealed severe metabolic and lactic acidosis and patient was intubated and resuscitated aggressively in Er. Ecg was obtained which showed global St/ T changes and hence cath lab was activated and Echo was done in Er which didn't reveal any wall motion abnormalities. Lab reports revealed severe anemia and patient was transfused with prbcs and patient condition improved and Ecg changes were also reverted.

**Keywords:** Severe Anemia; Emergency; Myocardial Infarction; ECG Changes; Anemia Mimicking as Myocardial Infarction.

## INTRODUCTION

### Background:

Anaemia is the most common disease and even more so in a tropical country like India. Although, the prevalence of anaemia is estimated at 9 per cent in countries with high development, in countries with low development the prevalence is

43 percent.<sup>1</sup> It affects the various organs including the heart. It is one of the most common causes of hyper dynamic state of heart at rest. It affects the heart by impairing the O<sub>2</sub> supply of myocardium<sup>2</sup>, thus supply demand myocardial mismatch causing myocardial ischemia or infarction.<sup>3</sup> A number of mechanisms are available to compensate for the decrease in O<sub>2</sub> transport associated with anaemia. They include an increase in Cardiac Output (CO) and decrease in circulation time.<sup>4</sup> These cardiac disturbances persist as long as the anaemia is severe<sup>2</sup> and quite strikingly these changes can be rapidly reversed by partial correction of anaemia in almost every instance.<sup>1</sup> In severe long standing anaemia, cardiac dilatation and hypertrophy are naturally expected due to hyperdynamic state.<sup>5</sup>

To substantiate this, ECG studies for cardiac disturbances have been made less frequently. There is a great diversity of opinion available in literature, on reports of ECG changes in anaemia.<sup>6,7</sup> Early reports have described a decrease in QRS amplitude, T wave flattening and minor degrees of atrioventricular (AV)

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conduction disturbances<sup>8</sup>, but these have not been observed in more recent studies. Later studies have reported frequent non-specific ST-T wave changes.<sup>9</sup> It is not certain, however that these changes are more common in anemic patients.<sup>1</sup> The abnormalities may be proportional to the severity of anaemia<sup>10</sup>, or show no correlation to Hb level.<sup>11</sup>

### Patient Information:

A 44 Year Old Male living in Urban area of Delhi, NCR region.

### Clinical Finding and Diagnostic Assessment:

44 Year Old Male presented to emergency with drowsiness since 1 day progressive in Nature, Breathing Difficulty Chronic Progressive in Nature aggravated on work and relieved on rest (Nyha Class 3) and sweating.

There was no History of Fever. Cough. Chest pain, Syncope, Trauma to head, Vomiting, headache, loose stools.

Patient Vitals were checked: Bp - 80/60, Pr - 122/Min, Feeble and regular, Spo2 - 85% on room air, Rr - 35/Min, Cbg - 110. Blood gas done which revealed severe metabolic and lactic acidosis.

General examination revealed pallor and bilateral pitting pedal edema with raised JVP.

### Systemic Examination:

**Respiratory System:** Bilateral Air entry equal, bilateral basal crepts plus.

**CVS, Abdomen:** No Abnormality Detected.

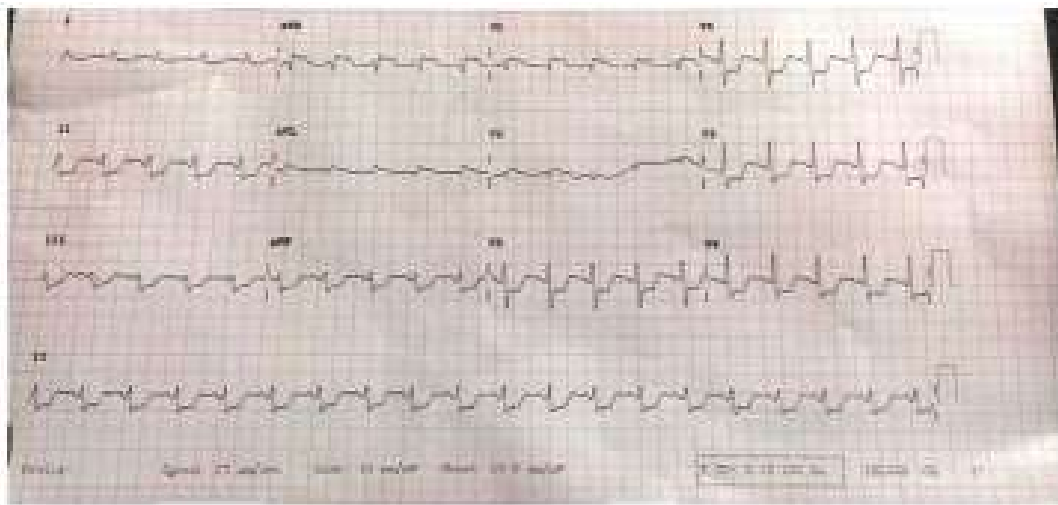
**CNS:** Patient was drowsy with GCS of E3v4m4.

ECG Was Done S/O. Global St/ T Changes and Image Added Below.

Blood Samples were sent such as CBC, LFT, KFT, Urine Routine and Microscopy, Nt Pro BNP, Cardiac Enzymes.

ECHO and Chest X Ray was ordered.

### Therapeutic Intervention:



Patient was initially treated for haemodynamic stability with IV Fluids, Vasopressors and inotropes AMD other supportive medications and intubated in view of severe respiratory distress.

Cath Lab was activated in view of St/ T Changes in ECG and patient was given full loading dose of aspirin, Atorvastatin and clopidogrel Via ryles tube and 5000 Iu of unfractionated heparin.

ECHO was done which was normal with no regional motion wall abnormalities and Ef was 55% and no Clot was detected.

Patient was then done NCCT head which was also normal. Blood reports revealed Hb of 1.7 and

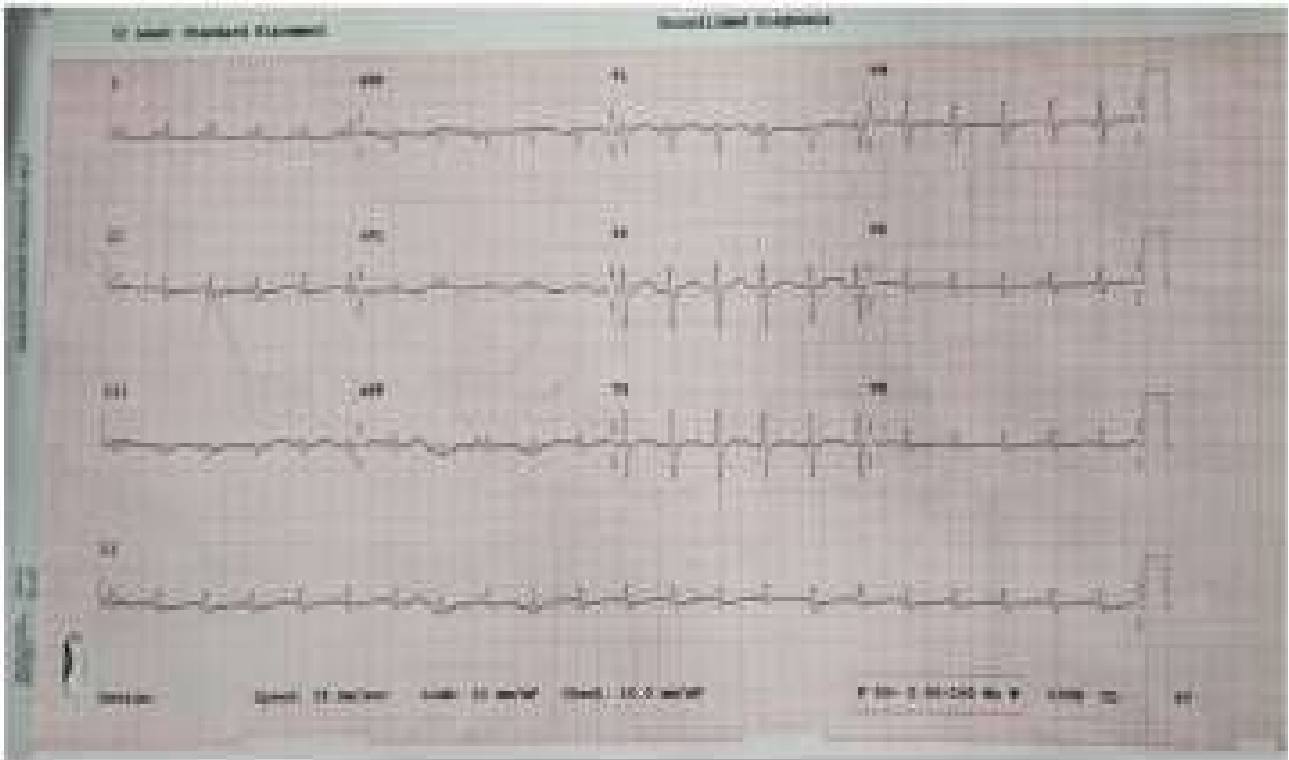
Nt Pro Bnp of around 25000 with no other abnormal values. Cardiac Enzymes were normal. Patient was then transfused with prbcs and patient was treated with diuretics and other supportive medications and patient improved.

## **DISCUSSION**

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A Cross Sectional study was Conducted in Correlation Between Haemoglobin Levels and ECH changes in Anemia.

Patient Initially was suspected as a case of Acute Left ventricular Failure/Myocardial infarction Due to



ECG changes. As ECHO turned out to be normal, patient was followed for blood reports which showed severe anemia.

ECG changes were normal after Transfusion of PRBC as uploaded in the Above Image.

## CONCLUSION

The above case report Mentions the case of severe anemia causing ST/ T changes. Though the Cath Labs must be initiated with patients of ST/ T changes, cases of severe anemia can also present with ST changes in ECG with heart failure.

## REFERENCES

1. Ministry of Health and Family Welfare, Government of India. Guidelines for control of Iron deficiency anaemia. New Delhi: Ministry of Health and Family Welfare, Government of India; 2013. Available at: [http://www.unicef.org/india/10.\\_National\\_Iron\\_Plus\\_Initiative\\_Guidelines\\_for\\_Control\\_of\\_IDA.pdf](http://www.unicef.org/india/10._National_Iron_Plus_Initiative_Guidelines_for_Control_of_IDA.pdf). Accessed 18 January 2014
2. Tandon OP, Katiyar BC. Ballistocardiographic study in severe anaemia. *Circulation*. 1961;23:195-99. [PubMed] [Google Scholar]
3. Bailey D, Aude YW, Gordon P, Burt D. ST segment elevation myocardial infarction, severe anaemia and non-obstructive coronary disease: case report and brief comment. *Conn Med*. 2003;67(1):3-5. [PubMed] [Google Scholar]
4. Harvey N. Principles and practice of medicine. 22nd ed. New Delhi: Prentice-Hall International Inc; 1988. Anaemia. In: Jhons RJ, Harvey AM, McKusick VA, Owens AH, Ross RS editors; p. 311. [Google Scholar]
5. Friedberg CK. In: Diseases of the heart. 3rd ed. Philadelphia: W.B. Saunders; 1969. The heart and circulation in anaemia; pp. 1678-86. [Google Scholar]
6. Ellis LB, Faulker JM. The heart in anaemia. *New Eng J Med*. 1939;220:943-5. [Google Scholar]
7. Sanghvi LM, Mishra SN, Banarji K. Electrocardiogram in chronic severe anaemia. *Am Heart J*. 1958;56:79-86. [PubMed] [Google Scholar]
8. Porter WB. Heart changes and physiologic adjustments in hookworm anaemia. *Am Heart J*. 1937;13:550. [Google Scholar]
9. Hunter A. The heart in anaemia. *Quart J Med*. 1946;15:107. [PubMed] [Google Scholar]
10. Winsor M, Burch L. The ECG and cardiac state in active sickle cell anaemia. *Am Heart J*. 1945;

29:685-90. [Google Scholar]

11. Szekely P. Electrocardiographic findings in anaemia. *Br Heart J.* 1940; 2(1):1-8. [PMC free article] [PubMed] [Google Scholar]
12. Gv S, Pk S, Herur A, Chinagudi S, Patil SS, Ankad RB, Badami SV. Correlation Between Haemoglobin Level and Electrocardiographic (ECG) Findings in Anaemia: A Cross-Sectional Study. *J ClinDiagn Res.* 2014 Apr; 8(4):BC04-6. Doi: 10.7860/JCDR/2014/8966.4202. Epub 2014 Mar 28. PMID: 24959433; PMCID: PMC4064835.

