“REDISCOVERING ARNETH COUNT” PREVALENCE OF MEGALOBLASTIC ANEMIA IN CHRONIC METFORMIN USERS AT GOVERNMENT STANLEY HOSPITAL, CHENNAI

Jayanthi R, Deenadayalan T, Chandramouleeswari K

Stanley Medical College

Abstract:
Recent US data estimate a 6% prevalence of biochemical B12 deficiency (serum B12,<148 pmol/L) among adult >60 years of age who are taking metformin. Arneth count- a very simple smear test to diagnose megaloblastic anemia, is almost forgotten in modern medicine era after the advent of automated analyzer. With this background we want to check the correlation between manifestations of vit B12 deficiency with duration of MF therapy and the correlation between Arneth index with MCV in diagnosis of Megaloblastic anemia. Our observation suggests that as the duration of metformin increase, degree of hyper segmentation of neutrophils as well as MCV tends to increase and one of the earliest, notable changes in the peripheral blood in megaloblastic processes is the appearance of hypersegmented neutrophils, so that validity of simple Arneth count can be realized, which can be performed very easily with simple microscope in early diagnosis of megaloblastic process, which is apt even in our PHC setup.
Background

Metformin –one of first line drugs for TY2DM, very commonly using in last 2 decades. Vit B12 is an essential nutrient for both normal haematopoietic process and neuro cognitive function. Biochemical and clinical vitamin B12 deficiency has been demonstrated to be highly prevalent among type 2 diabetes mellitus patients on metformin. Recent US data estimate a 6% prevalence of biochemical B12 deficiency (serum B12, <148 pmol/L) among adult >60 years of age who are taking metformin.

Arneth count- a very simple smear test to diagnose megaloblastic anemia, is almost forgotten in modern medicine era after the advent of automated analyzer. But it is a very simple test, readily can be done even in a primary care set up where automated analyser is not readily available.

Hypersegmented neutrophils -pathognomonic of megaloblastic anemias One of the earliest, notable changes in the peripheral blood in megaloblastic processes is the appearance of hypersegmented neutrophils. Because of the short life-span of neutrophils, these abnormal hypersegmented neutrophils characteristically appear even before the onset of anemia in megaloblastic processes.

Therefore we want to investigate the prevalence of Biochemical Vitamin B12 deficiency among metformin users in a tertiary care centre and the correlation between clinical and biochemical parameters and the validity of Arneth index with MCV estimation in diagnosing Megaloblastic anemia.

Objectives

- To check the correlation between manifestations of vit B12 deficiency with duration of MF therapy
- To check the correlation between Arneth index with MCV in diagnosis of Megaloblastic anemia

Methodology

A total of 100 diabetic patients who are taking metformin for atleast 1year were included in this study. With standard proforma, patients were subjected to symptom analysis and demographic details were collected. Clinical examination including CNS examination to identify the large fiber neuropathy was done. Laboratory investigations including Arneth index and MCV was done.
Observation

Mean Hb - 11.9g%

Mean Platelet count - 2.68 L/ cumm

Mean Total WBC Count - 8538 cells/cumm

Percentage of Neutrophils with at least 5 lobes - 4.05%

Mean MCV - 82.4 fl

Temporal association between duration of Metformin therapy and degree of hyper segmentation exists.

Temporal association between duration of Metformin therapy and degree of Megaloblastic changes (MCV > 96) also exists.
CONCLUSION

- As the duration of metformin increase, degree of hyper segmentation of neutrophils as well as MCV tends to increase
- One of the earliest, notable changes in the peripheral blood in megaloblastic processes is the appearance of hypersegmented neutrophils, so that validity of simple Arneth count can be realized, which can be performed very easily with simple microscope in early diagnosis of megaloblastic process, which is apt even in our PHC setup
- Very small scale study, need a multi centric large scale study to conclude.

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References:


