ORIGINAL ARTICLE

Frequency of Vitamin B12 Deficiency in Type 2 Diabetics

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ABSTRACT

Aim: To determine the frequency of vitamin B12 deficiency in type 2 diabetics.
Study Design: Descriptive case series
Place and duration of study: Diabetic Clinic CMH, Lahore from 1st October 2018 to 31st March 2019.
Methods: One hundred patients of diabetes mellitus type II were included. Their demographic data was obtained and recorded. Blood samples of the patients were taken using aseptic techniques and sent to Pathology Laboratory for measurement of serum vitamin B12 levels. Results were collected by the researcher next day and labeled and noted as deficiency.
Results: Twenty six (15.76%) were between 30-45 years of age whereas 139(84.24%) were between 46-60 years, mean age 50.52±6.39 years, male participation was 80(48.48%) and females 85(51.52%). The frequency of Vitamin B12 deficiency in type 2 diabetics was 19(11.52%).
Conclusion: There is no significant higher rate of Vitamin B 12 deficiency in type II diabetic.
Keywords: Diabetes mellitus, vitamin B12, deficiency

INTRODUCTION

Diabetes mellitus has evolved as an epidemic and a major public health issue throughout the world. Pakistan is also one of the countries where a large great population is suffering with diabetes[1]. Diabetes is recorded in 7.6% to 11% among adult population of our country[2]. Increasing trend in diabetes in urban population is mainly due to physical inactivity and obesity[3].

There is evidence that deficiency of Vitamin B12 is also seen in patients of diabetes mellitus, using metformin as an anti-diabetic agent. A study conducted by Akinlade et al[4] reported the frequency of vitamin B12 deficiency among patients of diabetes mellitus type 2 taking metformin as 8.3%. Iftikhar et al[5] reported Serum B12 deficiency in 31% patients on metformin as compared to only 8.6% among diabetic patients not taking metformin.[5] But no study has been conducted so far exclusively on patients with diabetes mellitus type 2 to give information regarding its frequency specifically.

The rationale of this trial was to determine the frequency of deficiency of Vitamin B12 diabetics. It is seen that both signs and symptoms of vitamin B12 deficiency appear late in DM2 with majority of patients remain totally asymptomatic for years and, when the symptoms appear, Vitamin B12 is usually in advanced stages.[6] Thus it becomes highly important to determine its burden in the patients of type 2 diabetes mellitus. However, scarce literature exists on international level as well as local level regarding its frequency in patients of type 2 diabetes mellitus specifically. Thus this study will provide a baseline data about the frequency of vitamin B12 deficiency in type 2 diabetics in Pakistani context which will give an idea about magnitude of the problem. These results will help clinician in timely screening of patients for its presence and early management that will improve the quality of life in these patients due to this neglected complication of type 2 diabetes mellitus.

MATERIAL AND METHODS

A total of 100 cases between 30 years to 60 years of age of either gender having diabetes Mellitus type for atleast one year determined on medical record and history were the part of our research work whereas we excluded all cases with chronic liver disease determined by history and presence of coarse echo texture of liver on ultrasonography, having chronic kidney disease determined by history and an estimated glomerular filtration rate <60mL/min/1.73m^2 determined by MDRD equation, adrenal insufficiency determined by history and serum cortisol (Low early morning serum cortisol levels <3 mcg/dl), ischemic heart disease determined by history and medical record, prior gastric surgery determined on history and medical record, current parenteral or enteral nutritional support determined on history and medical record and with use of B12 supplements (oral or parenteral) or vegetarians or proton pump inhibitors during last 3 months determined on history and medical record. Blood samples of the patients were taken using aseptic techniques and sent to pathology laboratory of CMH Lahore for measurement of serum vitamin B12 levels. Results were collected by the researcher next day and labeled and noted. The data was analyzed by applying SPSS 17th Version and the frequency of deficiency of vitamin B12 was presented in the form of frequency and percentages.

RESULTS

Fifteen percent of population between 30-45 years of 85(85%) between 46-60 years, mean age 50.52±6.39 years (Table 1). Male cases were 49(49%) and remaining 51(51%) were female cases (Table 2). Vitamin B12 deficiency in type 2 diabetics was 13(13%) whereas 87(87%) had no findings of the morbidity (Table 3).

Table 1: Age distribution (n=100)

Age (years)	No.	%
30-45	15	15
46-60	85	85
Mean±SD	50.52±6.39	

Table 2: Gender distribution (n=100)

Gender	No.	%
Male	49	49
Female	51	51

Table 3: Vitamin B12 deficiency in type 2 diabetics (n=100)

Vitamin B12 deficiency	No.	%
Yes	13	13
No	87	87

DISCUSSION

The rationale of this study was to determine the frequency of deficiency of Vitamin B12 in patients of type 2 Diabetes Mellitus. It is seen that both signs and symptoms of vitamin B12 deficiency appear late in DM2 with majority of patients remain totally asymptomatic for years and, when the symptoms appear, Vitamin B12 is usually in advanced stages.[6] Thus it becomes highly important to determine its burden in the patients of type 2 diabetes mellitus. However, scarce literature exists on international level as well as local level regarding its frequency in patients of type 2 diabetes mellitus specifically. Thus this study may provide a baseline data about the frequency of vitamin B12 deficiency in patients of type 2 Diabetes Mellitus in Pakistani context which may give an idea about magnitude of the problem. These results will be helpful clinician in timely screening of patients for its presence and early management that will improve the quality of life in these patients due to this neglected complication of type 2 diabetes mellitus.

Our data showing 15(15%) of population between 30-45 years of 85(85%) between 46-60 years, mean age 50.52±6.39 years. Male cases were 49(49%) and remaining 51(51%) were female cases. Vitamin B12 deficiency in type 2 diabetics was 13(13%) whereas 87(87%) had no findings of the morbidity.

Our data is near to a study conducted by Akinlade et al[4] reported the frequency of vitamin B12 deficiency among patients of diabetes mellitus type 2 taking metformin as 8.3%. Another study conducted by Iftikhar et al[5] reported Serum B12 deficiency in 31% patients on metformin as compared to only 8.6% among diabetic patients not taking metformin. This frequency was higher than recorded in our study.

Jager and colleagues[7] in a randomized controlled trial (RCT) followed all type II diabetic who were taking metformin 2550 mg/day for more than 50 months and concluded that metformin use was responsible for vitamin B12 deficiency in 19% which was significantly higher than placebo.

Long-term use of metformin may cause a significant reduction in Vitamin-B12. Our study reveals that type II diabetics taking metformin may be sought out vitamin B12 deficiency and suggested to use multivitamin regularly for its prevention[8]. Protective role of multivitamin is hypothesized in diabetic cases taking metformin.

We faced several limitations during this trial. Single-center study was the potential concern, as without external validity, the whole community may not cover the considerable variation. Secondly, we did not measure the methylmalonic acid in blood, which could have resulted in further enhancement of sensitivity by recognizing the vitamin B12 deficiency. Thirdly, without a control group we may not determine the vitamin B12 deficiency in general population. Further, we did not record the outcome of vitamin B12 deficiency. However, a regular follow-up is inevitable for evaluation of outcome of the dosage and the time period for which vitamin B12 supplement may be necessary.

CONCLUSION

Our study did not show a significant higher rate of Vitamin B 12 deficiency in type II diabetic. However, local multicenter studies may validate our results.

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