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1.Paresthesia with sensation of loss of balance in a 58-year-old male patient.

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2.Objective: To assess if B12 deficiency can be a significant contributor to Ataxia and paresthesia in an otherwise normal man.

الهدف: تقييم ما إذا كان نقص فيتامين ب ١٢ له دور فعال في عدم التوازن والشعور بالتنميل في الذكر الطبيعي.

3.1 الملخص

فيتامين ب له علاقة في حالات تشوش الحس وفقدان الذاكرة.

ليس من غير المألوف أن نجد أنه في عدد السكان المتزايد في حالة حدوث الحرص في التقدير الغذائي / أو جراحات السمنة قد يصاب المرضى بنقص فيتامين ب 12

وهذا يأتي هذا باشكال مختلفة

قد يعاني البعض من فقدان الذاكرة على المدى القصير أو ترنح أو تنميل على سبيل المثال لا الحصر.

شوهدت إحدى هذه الحالات لرجل يبلغ من العمر 58 عاما يتمتع بصحة جيدة ويعاني من ترنح وتنميل



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3.1 Abstract

Vit B 12 is implicated in cases of paresthesia and memory loss.

It is not uncommon to find that in the growing population with an increased incidence of dietary discretions and/or bariatric surgeries patients are developing B12 deficiency.

These have different and multiple presentations.

Some may present with short term memory loss or ataxia or paresthesia to name a few.

One such case of an otherwise healthy 58-year-old male was seen who presented with ataxia and paresthesia.

Keywords 3.2

Ataxia, paresthesia, memory loss, B12 deficiency

4. Case study:

4.1 Introduction

In the case studied in this article, the history revolves around a 58-year-old otherwise healthy man, who noticed that progressively he was developing neurosensory symptoms with sensation of ants crawling under his skin or numbness involving both hands and feet. He also felt off balance at times.

This case study explores the methodology adopted in managing this case to assess what is the root cause of this presentation by starting with the metabolic profile and following up with further tests to ensure complete resolution of symptoms with ongoing long-term advice for the patient.



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4.2 Main Body

4.2.1 Patient Characteristics

58-year-old Egyptian male presented with history of balance issues when walking with a sensation of pins and needles in both legs and hands

This was going on for some time before he decided to consult a family physician.

He denied any recent fall, hit to his head or back or loss of consciousness. No loss of power or sensation did not start dropping objects, no speech or visual changes both transient and permanent.

Upon review, he was found to have normal gait with no cerebellar signs, but he reported paresthesia involving both hands and feet. Power and sensation as aforementioned were normal.

4.2.2 initial Clinical Impression

Given he had no co morbidities a full panel of bloods was ordered to investigate if there was any underlying metabolic problem prior to considering any mental health disorder. It was imperative that a detailed dietary and lifestyle history was taken to see if he had any other possible underlying causes to his paresthesia. This included history of any alcohol consumption, drugs other than those listed in his medical records, any symptoms of any other possible infections he may have concurred including a full STI workup. Surgical history with a rising trend of bariatric surgeries seen more commonly nowadays in the Middle East also an important part of the workup.

His history revealed that he had suffered pancreatitis and has had cholecystectomy performed with no further details available.

4.2.3 Findings of his blood tests

A blood study was conducted which found megaloblastic anemia with Hb of 11.1mg/dl and MCV of 107.3 fl and a b12 level of less than 73pmol/l. The rest of the blood markers for LFTS, folate, RFTS, TFTS were normal. STI check was proposed.



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4.2.4 Management of his blood test report with follow up further investigation.

He was started on IM cyanocobalamin every week for 6 weeks with a follow up blood level of B12 and parietal cell and intrinsic cell antibodies.

His B12 level after 6 injections was improved to 381pmol/l and his antibody screen came back positive confirming Pernicious anemia.

4.2.5 Psychosomatic Examination

On follow up assessment he admitted to having short term memory loss at the time of presentation which he had not mentioned with easy forgetfulness and at times confusion, no long-term memory loss was observed.

He confirmed that his short-term memory loss had completely resolved by this simple intervention MMSE post treatment was normal.

4.2.6 Final diagnosis and Management

Analyzing his B12 levels along with megaloblastic anemia picture and the further tests with both Parietal cell and Intrinsic cell antibody tests coming back positive, it is safe to say that he is a case of Pernicious anemia and will require regular B12 parenteral replacements to prevent any further demyelinating injury to his nerves resulting in a similar clinical picture in the future.

Typically, neurological symptom improvement is slower than hematological improvement, and the degree of neurological recovery is inversely proportional to the severity and duration of symptoms before treatment. Psychiatric symptoms such as emotional lability and psychosis may rapidly improve.[Kumar N. (2014).]

Before the discovery of treatment, pernicious anemia could be fatal.[Green R. (2017)] The prognosis since has been excellent with appropriate management, except for patients diagnosed with SCD. Although B12 supplementation stops progression and improves neurologic deficits in most patients with SCD, evidence shows complete resolution only occurs in a small percentage of them. After treatment initiation for pernicious anemia, reticulocytotic activity begins approximately 5 days later, followed by red blood cell count normalization within 4 to 6



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weeks.[Stabler S. P. (2013)]this was observed for this particular case as well when follow up blood levels were done after 6 weeks of initiation of treatment.

He will also need further education about other associated illness with pernicious anemia such as vitiligo, rheumatoid arthritis, atrophic gastritis and his risk of gastric cancer which is higher in people with pernicious anemia as compared to general population.

5.Discussion/conclusion:

Worldwide, pernicious anemia is a common cause of megaloblastic anemia; it has been found that it affects people of all ages, particularly those over 60-70.

It affects all genders with a varying geographical female-to-male ratio; and the prevalence is found to be less in those of Asian descent compared to other studied populations.

[Rustgi,2021][Stabler S. P. (2013)[Maktouf, C.,2006]

Pernicious anemia is found in up to 25% of patients with autoimmune gastritis (AIG), which affects the corpus and fundus and is characterized by parietal cell antibodies destroying parietal cells located only in the oxyntic mucosa. The parietal cells produce IF (intrinsic factor) and hydrochloric acid. Low secretion of HCL results in a decrease in the release of cobalamin bound to dietary protein, and lesser number of parietal cells are available to produce the IF needed for dietary B12 absorption.

The term pernicious anemia has been used synonymously to AIG; however, it is considered a late-stage manifestation as a part of the AIG clinical spectrum.[Htut, T. W., Thein, K. Z., & Oo, T. H. (2021)] [Lenti, M. V.,et al 2020][Shah, S. C., 2021]

Whether or not Helicobacter pylori plays a causative role in pernicious anemia is unclear.[Rustgi,2021]



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Important differential diagnosis are as follows

- myelodysplastic syndromes
- hemolytic anemia
- thrombotic thrombocytopenic purpura

Other causes of B12 deficiency:

- food-cobalamin malabsorption
- veganism
- metformin
- long-term proton pump inhibitor therapy
- estrogen contraceptive pills
- gastric surgery
- ileal disease
- ileal resection

Other causes of macrocytosis:

- folate deficiency
- methotrexate
- alcohol use disorder

Other causes of peripheral neuropathy:

- diabetes mellitus
- carpal tunnel syndrome
- infections
- medications



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- other vitamin deficiencies
- alcohol use disorder

An international meta-analysis of over 22,000 patients with pernicious anemia found a pooled gastric cancer incidence of 0.27% per person-year. The same study showed a pooled gastric cancer recurrence rate of 6.8. [Vannella, L., Lahner, E., Osborn, J., & Annibale, B. (2013).]

Looking back at this case study to summarize, any patient with ataxia, memory concerns or paresthesia should have B12 deficiency and pernicious anemia as a differential and should be investigated. The importance of having regular follow ups and the increased incidence of gastric cancer along with other associations need to be communicated to the patient as well so he remains mindful of the long-term nature of the disease process.

It is not uncommon to find that once the baseline deficiency is resolved and symptom improvement occurs the patient stops doing follow-ups and may present later with worsened prognosis.

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