Ferritin Without Fibrosis: Asymptomatic Hyperferritinemia in Primary Care (Case Report)

Abstract

Background:

Elevated levels of serum ferritin in the blood are not commonly observed in individuals who are asymptomatic and do not have an underlying condition.

In such cases, hyperferritinemia is usually linked to liver inflammation, resistance to insulin, or a mild accumulation of iron. It can also be connected to the seriousness of a disease.

Case Presentation:

A 56-year-old male patient was seen in our primary health care in the National Guard Health Affairs.

His medical history included obesity, type 2 diabetes, brucellosis, and hypertension. He was found to have persistently high ferritin levels during routine medical check-ups, with readings consistently between 1300 and 1500. Imaging studies illustrated signs of hepatic steatosis compatible with fatty liver disease. A Fibroscan indicated no fibrosis, normal stiffness and mild fat accumulation. Liver iron study MRI showed moderate liver iron deposition. Further genetic tests ruled out hereditary hemochromatosis or other causes of secondary iron overload. Laboratory results for liver function were within normal limits.

Conclusion:

This case demonstrates the relation between elevated ferritin levels and metabolic-associated fatty liver disease (MAFLD), emphasizing the need to consider fatty liver disease as a potential cause of hyperferritinemia, especially in patients who also have other characteristics of metabolic syndrome.

1. Introduction:

Hyperferritinemia is a common biochemical finding in clinical practice and often necessitates further investigation for disorders involving excessive iron accumulation, such as hereditary hemochromatosis.

Normal serum ferritin levels range from 40 to 200 ng/mL (40 to 209 mcg/L; 89.9 to 449 picoM/L).Serum ferritin is typically used as an indicator of stored iron in the body. However, it also acts as an acute-phase reactant, which means it can increase in response to chronic inflammation of the liver, infections, or other liver-related diseases. Hyperferritinemia is often seen in people with metabolic-associated fatty liver disease (MAFLD), which was previously called non-alcoholic fatty liver disease (NAFLD) [1]. In such conditions, high ferritin levels could indicate systemic inflammation, damage to liver cells, or an excess of stored iron in the body [2].

In MAFLD, increased ferritin levels may reflect inflammation within the liver, injury to liver cells, or slight changes in iron metabolism, even in the absence of significant iron accumulation in the liver cells itself.
This situation is known as dysmetabolic iron overload syndrome (DIOS). DIOS is marked by high serum ferritin levels with either normal or slightly increased levels of transferrin saturation. It is often associated with other metabolic conditions such as insulin resistance, central obesity, and dyslipidemia [3,4]. Although significant hyperferritinemia may require more advanced testing for genetic hemochromatosis or other iron-related conditions, it is important to recognize that fatty liver disease can be presented with similar blood test results to those seen in normal conditions.
We are reporting a case where a patient had elevated ferritin levels without signs of hereditary hemochromatosis or other secondary causes of iron overload.
This case shed the lights to the importance of interpreting ferritin levels in the context of metabolic disorders and its findings from imaging studies

3. Case Presentation

A 56-year-old gentleman with a history of type 2 diabetes mellitus, dyslipidemia, obesity and brucellosis was found to have persistently elevated serum ferritin levels, which were discovered incidentally during routine follow-up.
He reported no symptoms of fatigue, abdominal pain, arthralgia, or skin hyperpigmentation.His past medical history was notable for type 2 diabetes managed with metformin, dyslipidemia treated with atorvastatin, obesity managed with diet and exercise, and a remote history of brucellosis. He denied smoking or alcohol consumption. There was no family history of chronic liver disease.
Serial laboratory investigations showed persistently elevated ferritin levels (table1), initially 896 µg/L in August 2023, rising to >1500 µg/L in February 2025. Complete blood count and liver function tests were within normal limits. Iron studies were unremarkable, and genetic testing for hereditary hemochromatosis was negative.Furthermore,Abdominal ultrasonography demonstrated fatty liver. Liver iron quantification by MRI revealed an R2 water value of 40.8, indicated mild-to-moderate iron deposition.
Based on the findings, hyperferritinemia was considered most likely related to non-alcoholic fatty liver disease (NAFLD), although isolated hyperferritinemia remained in the differential diagnosis.

Table1: Trends of Ferritin levels during follow-up

August 2023	896 µg/L
December 2023	1119 µg/L
May 2024	1283 µg/L
August 2024	1025 µg/L
February 2025	1595 µg/L

4. Discussion

Ferritin is among the most frequently ordered laboratory tests in both primary and secondary care, and abnormal measurements are reported with notableregularity.(5)Nevertheless, elevated results are often under investigated in primary care, with reports suggesting that up to 50% of cases receive no follow-up.(6) Hyperferritinemia is usually defined by a level of total serum ferritin (TSF) exceeding 200 µg/L in women and 300 µg/L in men. Although serum ferritin exhibits considerable heterogeneity across age, ethnicity, and sex, a threshold of 10,000 µg/Lis commonly used to denote marked or extreme hyperferritinemia.(7,8) Clinically, interpretation must consider both iron stores and non-iron overload drivers (inflammation, liver injury, metabolic dysfunction).

Here, we have described a case of a patient who had who had features of metabolic syndrome including diabetes mellitus, hypertension and hyperlipidemia with persistent hyperferritinemia and moderate liver iron deposition, aside of negative genetic test for hereditary hemochromatosis and exclusion of other secondary causes of iron overload. As this supports the diagnosis of dysmetabolic iron overload syndrome (DIOS) in patients with persistent hyperferritinemia, rather than genetic causes or fibrotic liver disease.

Emerging data strengthen this interpretation, In a 2025 cohort (n=943), ferritin increased across WWI tertiles (p-trend <0.01); WWI correlated with ferritin (R=0.26) and remained independently associated after adjustment (β≈0.19), while higher WWI increased the odds of hyperferritinemia (OR ~2.1 in men; ~3.2 in women). These findings fit our case: in MASLD, adipose driven inflammation and altered iron handling (DIOS) can yield marked hyperferritinemia despite absent fibrosis on Vibration-Controlled Transient Elastography (VCTE)(9)

Attentionally, In a 2013 retrospective study of 627 patients with ferritin levels above 1,000 in an academic center,iron overload syndromes was found in 136 out of 627 patients as one of the causes of the elevated ferritin. As found obesity, arterial hypertension, dyslipidemia, and/or abnormal metabolism of glucose or BMI> 25 kg/m². It is associated up to 50% with MASLD (10)

Other study have shown in a T2DM and MASLD cohort sturdy that included 271 patients, hyperferritinemia associated with higher liver steatosis and fibrosis indices and ~3.7×greater odds of advanced fibrosis in contrast to a very high ferritin (>1000 ng/mL) in our patient's his fibroscan showed normal stiffness with only mild steatosis, supporting the concept of metabolic hyperferritinemia and the limited specificity of ferritin for fibrosis. (11)

Management should therefore priorities metabolic risk factor optimization (weight reduction, glycemic and lipid control) and structured surveillance using validated non-invasive tools, rather than empiric phlebotomy in the absence of HH or fibrosis. For unexplained, moderately elevated

ferritin (<1000 µg/L) with normal transferrin saturation, observation with lifestyle intervention and reassessment at 3–6 months is reasonable. In liver disease not attributable to HH, therapeutic phlebotomy has not demonstrated clear benefit and is generally of limited value. (12)

Early recognition of DIOS in patients with persistent hyperferritinemia can prevent unnecessary invasive testing, refine risk stratification, and guide targeted, metabolism-focused care.

5. Conclusion

In family medicine, hyperferritinemia is frequently detected incidentally during routine clinical evaluations. Although most cases are asymptomatic or secondary to other conditions, each patient should undergo a systematic assessment to facilitate the early detection of clinically significant iron overload and underlying metabolic disorders. A structured approach is essential to differentiate true iron overload from metabolic-associated fatty liver disease. Recognizing this distinction at the primary care level can prevent unnecessary investigations and promote targeted, evidence-based management.

7. References

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