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The 'iron salute' in haemochromatosis

Case study

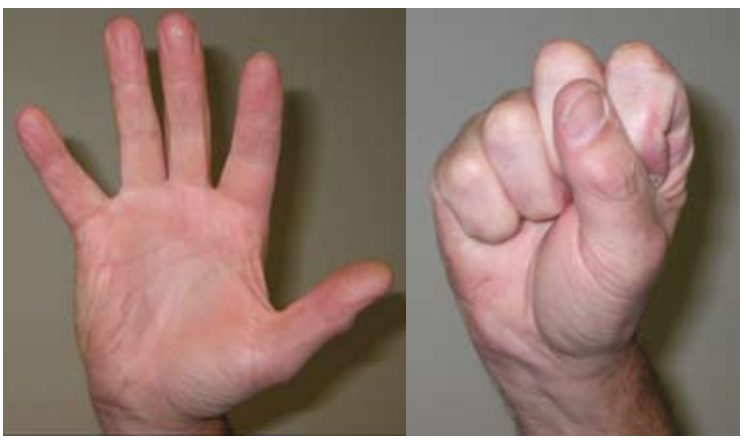
Mr W, 43 years of age, presented with a 2 year history of arthralgia and diminishing grip strength. He reported mild fatigue but was otherwise healthy. On general examination he appeared well. There was bony swelling over the second and third metacarpophalangeal (MCP) joints of both hands, with mild tenderness and impaired flexion of these joints – producing the 'iron salute' (*Figure 1*). There was no synovitis on peripheral joint examination.

Mr W was not pigmented and had no symptoms or signs of liver disease, hypogonadism, cardiac failure or diabetes. A clinical suspicion of haemochromatosis was supported by abnormal iron studies (*Table 1*). Plain hand radiographs showed only mild joint space narrowing and bony sclerosis in the MCP joints but no osteophytes. HFE genotyping revealed homozygosity for the C282Y mutation. A liver biopsy did not show fibrosis or cirrhosis but confirmed that he had iron overload. Mr W's first degree relatives were alerted to his diagnosis and tested. Mr W started a course of venesection, however, even after this treatment produced biochemical 'de-ironing' (serum ferritin level fell to 19 ng/mL and transferrin saturation level fell to 22%) he continued to experience arthralgia and mild joint restriction.

The presentation of haemochromatosis is typified by abdominal pain, arthralgia and fatigue or weakness.[1] Arthropathy may be the major presenting feature. The detection of an osteoarthritis-like process involving the metacarpophalangeal (MCP) and wrist joints in middle aged men should signal the possibility of underlying haemochromatosis. Other joints such as the shoulder, hip, knee or ankle may be affected. However, the preferential involvement of the second and third MCP joints is striking and may provide the opportunity for early identification of iron overload disease.[2] The 'iron salute' can be an efficient screening tool for this MCP joint arthropathy but it is not well known by clinicians.[3]

The presence of the 'iron salute' in patients with fatigue, arthralgia or unexplained abdominal pain should prompt testing for haemochromatosis. While the 'iron salute' is a valuable clue, it is not specific, as a similar MCP arthropathy may occur in calcium pyrophosphate deposition disease without haemochromatosis, and occasionally in otherwise healthy manual labourers. The radiological hallmarks of advanced haemochromatosis arthropathy

Figure 1. The iron salute in haemochromatosis



include irregular joint space narrowing, subchondral bone sclerosis, bone cysts, 'hook-like' osteophytes in the MCP joints, and chondrocalcinosis.[4]

Genetic haemochromatosis is due to mutations in the HFE gene. A recent analysis showed that in caucasian adults of northern European ancestry, 0.5% were homozygous for the causative C282Y HFE gene mutation but only 28% had definite iron overload disease.[5] Men with serum ferritin levels >1000 ng/mL were more likely to manifest end organ damage such as MCP joint arthropathy. The precise role of the HFE gene in the pathogenesis of haemochromatosis arthropathy is unknown, and heterozygosity for C282Y or H63D mutations is not independently associated with arthritis in the general population.[6]

Although liver disease determines survival in haemochromatosis, arthropathy is a major quality of life issue in these patients.[2,7] The outcome after venesection is unpredictable. In a 5 year study involving 181 patients with liver biopsy proven iron depletion, 20% reported their arthritis being worse, 50% stable, and only 30% registered improvement.[7]

Table 1. Serum iron studies and liver tests at presentation

Parameter	Value	Reference range
Iron	40.1 µmol/L	(12–28)
Transferrin	2.08 g/L	(2.00–3.80)
Transferrin saturation	76%	(15–50)
Ferritin	1230 ng/mL	(30–300)
Total protein	70 g/L	60–82
Albumin	42 g/L	35–50
Alkaline phosphatase	114 U/L	30–120
Bilirubin	7 µmol/L	<25
Gamma glutamyl transferase (GGT)	78 U/L	<51
Aspartate aminotransferase (AST)	55 U/L	<41
Alanine transaminase (ALT)	58 U/L	<51

Conclusion

The 'iron salute' is an interesting sign of haemochromatosis arthropathy. A greater awareness of this clinical sign has the potential to improve identification of haemochromatosis arthropathy and hence iron overload disease.

Conflict of interest: none declared.

References

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