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DETERMINANTS, BIOMARKERS AND CONSEQUENCES OF THE HEPATIC IRON DEPOSITION

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INTRODUCTION: Background:A possible side effect of intravenous iron treatment in patients on haemodialysis (HD) is the excessive hepatic deposit, which could occasionally lead to secondary hemochromatosis. Currently, the quantification of hepatic iron deposition by nuclear magnetic resonance (MRI) is considered the best non-invasive method, equivalent to liver biopsy. **Aims**: A) To evaluate the concentration of hepatic iron deposition by MRI in patients on haemodialysis. B) To analyze the relationship between hepatic iron deposits and clinical and analytical variables.

METHODS: This observational study examined 36 patients in maintenance HD belonging to a Spanish unit. Iron deposition was estimated by Rennes scale. Each patient underwent a hepatic MRI to quantify the iron deposition in order to correlate the findings with the mean weekly iron sucrose and darbepoetin alfa dose in the last 3 months. In addition, iron deposition was correlated with mean analytical parameters associated to iron treatment and liver function in the last 3 months. Baseline characteristics of the patients were recorded. Non-parametrics statistics techniques were used. $p < 0.05$ was considered significant.

RESULTS:

Table 1. Correlation between hepatic iron deposition and outcomes.

Variables	Normal (0-50)	Slight (51- 100)	Moderate (101-200)	Severe (>200)	p (K.Wallis)
Patients (n %)	6 (17%)	17 (47%)	8 (22%)	5 (14%)	
MRI iron (mosm/g)	43,8 ± 4,2	72,7 ± 16,3	149,3 ± 30,1	232,8 ± 19,7	<0,001
Hb (g/dl)	11,1 ± 0,9	11,1 ±1,1	11,4 ± 0,7	11,7 ± 0,6	0,8
Ferritin (ng/ml)	480 ± 272	634± 364	906 ± 363	1529 ± 445	0,02
TS (%)	27,7 ±1 2,1	24,7± 4,8	27,5 ± 8,4	32,9 ± 10,8	0,4
AST (UI/L)	19,2 ± 4,4	19,4 ±4,4	18,9 ± 6,3	22,1 ± 9,5	0,9
ALT (UI/L)	21,6 ± 7,1	16,5 ±4,5	19,5 ±7,3	16,5 ± 11	0,3
GGT(UI/L)	97,3± 88,7	59,90 ±50,90	43,56 ± 34,71	36 ± 28,3	0,2
Albumin(g/dl)	3,4 ± 0,3	3,6 ± 0,3	3,8 ± 0,3	3,5 ± 0,3	0,3
Iron sucrose (mg/sem)	56,4 ± 36,3	109,5±80,4	79,1 ± 71,5	113,3 ± 70,1	0,1
Time on HD (months)	3,8± 4,1	15,7 ± 20,3	29,5 ± 26,9	58,8 ± 64,9	0,04

Hb: hemoglobine, TS (%): trasnferrin saturation, AST: apartate transaminase, ALT: alanine transaminase, GGT: gamma-glutamyl trasnpeptidase

CONCLUSIONS: Ferritin was confirmed as the best biomarker of iron deposition, without differences in the relationship between iron overload and IST in the different groups. The mean dose of intravenous iron administered during the last 3 months did not have significant effect on the iron deposition. However, it was significantly associated with time in treatment on HD, suggesting that the cumulative iron dose increases the iron deposits over the years. Finally, there was a non-significant correlation between the liver function biomarkers and the hepatic deposits among different groups, which suggests that higher levels of iron deposition do not cause hepatotoxicity.