

# INTRAVENOUS IRON SUCROSE AND OXIDATIVE STRESS IN CHRONIC KIDNEY DISEASE STAGE 4 AND 5

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## Introduction<sup>1-4</sup>

The correction of iron deficiency anaemia in Chronic kidney disease (CKD) using intravenous iron therapy has been postulated to increase oxidative stress which may impact cardiovascular outcomes and mortality.

## Objective

To assess the oxidant effect of intravenous(IV) iron sucrose in CKD stage 4 and 5 patients by estimating change in levels of highly sensitive C reactive protein (hsCRP), malondialdehyde (MDA) and myeloperoxidase (MPO) pre and post intravenous iron therapy.

## Methodology

**Study Design:** Prospective Observational

**Study duration** 4 months

**Study site:** Department of Nephrology, Kasturba Hospital, Manipal

**Inclusion criteria:**

➤ Adult CKD stage 4 or 5 Patients not on dialysis with iron deficiency i.e. serum iron/Total iron binding capacity < 20% or serum Ferritin < 200 ng/L.

**Exclusion criteria:**

➤ Patients with infections, malignancy, received blood transfusions, previous IV iron therapy, Pregnancy, immunosuppressives up to 1 month prior, hypersensitivity to IV iron, liver disease

**Data collection**

hsCRP, MDA, MPO were measured using standard methods immediately prior to and 48 hours after a 100mg IV dose of iron sucrose

**Data Analysis:** on SPSS version 15. Wilcoxon signed rank test was used to compare medians and a p value less than 0.05 was considered significant.

## Results & Discussion

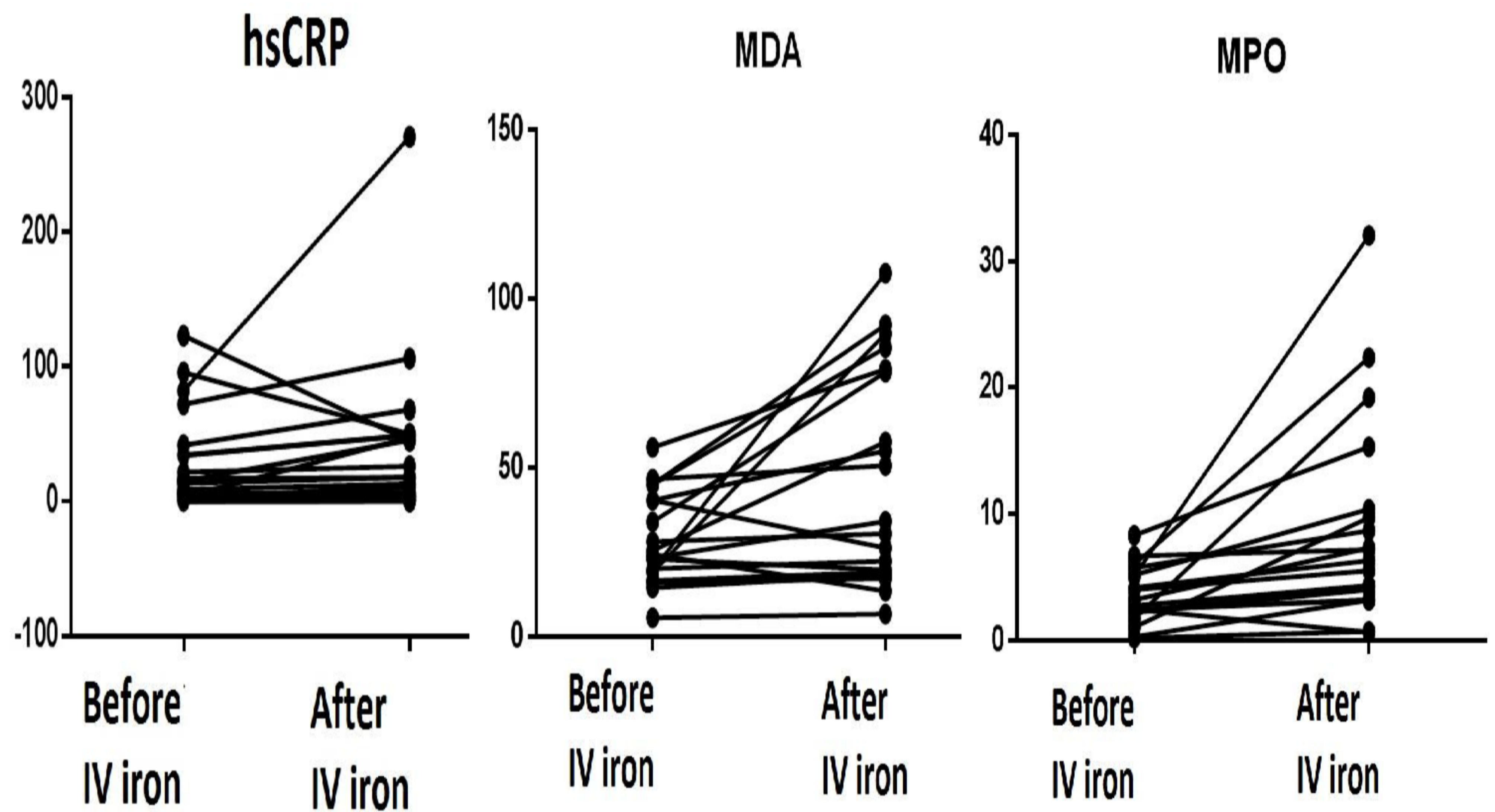
**Table 1: Demography**

Total number of patients	32
Males	26 (81.3 %)
Number of patients with CKD stage 5	13 (40.6 %)
Diabetes mellitus	17 (53.1%)
Age ( years )	55.3 ± 12.2
Creatinine clearance mean ( ml/min)	16.7 ± 8.7
Serum albumin mean (g/L)	3.5 ± 0.6

**Table 2: Mean Iron Indices**

Iron saturation %	23.2 ± 12.2 %
Serum Ferritin ( ng /L )	134.2 ± 117.7

## Changes in hsCRP, MDA, MPO after IV iron



**Table 3: Changes in hsCRP pre and post iv**

NUMBER = 32	Pre	Post
Median	5	6
Minimum	0	0
Maximum	123	271
PERCENTILE	25	1
	50	5
	75	20.75

**Table 4: Changes in MDA pre and post IV iron**

NUMBER = 21	Pre	Post
Median	26	30
Minimum	6	7
Maximum	56	108
PERCENTILE	25	20
	50	26
	75	40

**Table 5: Changes in MPO pre and post iv iron**

NUMBER = 21	Pre	Post
Median	2	5
Minimum	0	1
Maximum	8	32
PERCENTILE	25	2
	50	2
	75	4.75

**Table 6: Changes in hsCRP, MDA, MPO Pre and post IV iron sucrose in CKD stage 4 & 5**

Oxidant stress parameters	Number of patients	Pre IV iron median & interquartile range	Post IV iron median & interquartile range	p value
hsCRP ( mg/L )	32	5 ( 1 to 20.75 )	6 ( 3 to 45 )	0.005
MDA ( nmol/ ml )	21	26 ( 18 to 40 )	30 ( 18.5 to 78.5 )	0.003
MPO ( U/dl )	21	2 ( 2 to 5 )	5 ( 3 to 10 )	< 0.05

## Conclusion

We observed an increased oxidative stress as evidenced by rise in hsCRP, MDA and MPO following intravenous iron in CKD stage 4 and 5. The clinical relevance of these findings and their effects need further study.

## References

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