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- **Title:** Does 1000 mg Ferric Carboxymaltose Have An Additional Benefit On The Haemoglobin Recovery Post Total Knee Arthroplasty? - A Comparison With 500 Mg Of Ferric Carboxymaltose.
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Disclosures

1. Adit Maniar : None
2. Ashwini Khokhar : None
3. Akshay Nayak : None
4. Naveen Chandar : None
5. Abhinav Mishra : None
6. Rajesh Maniar : Outside the submitted work:
 - DePuy Synthes, USA – Royalty
 - DePuy Synthes, India – Paid Consultant
 - Smith & Nephew – Paid Consultant
 - Indian Society of Hip and Knee Surgeon – Trustee and Past President



INTRODUCTION

- Anemia after surgery affects outcomes post total knee arthroplasty (TKA).¹
- Intravenous Ferric Carboxymaltose (FCM) is a newer generation of iron preparation with a good safety profile that can be administered rapidly.
- Previously, we reported that 500 mg of FCM on the first postoperative day hastens the recovery of haemoglobin (Hb) at 5 weeks post TKA as compared to no treatment and only one patient developed a possible minor allergic reaction.²
- The maximum permissible dose of FCM is 1000 mg.
- This encouraged us to study the effect of the permitted full dose of 1000 mg of FCM on Hb recovery post TKA.



METHODS

- We prospectively collected data from 172 consecutive patients operated between June 2021 and May 2022 by a single surgeon.
- All patients included in the study group received 1000 mg intravenous(IV) FCM on postoperative Day 1.
- Our control group consisted of retrospectively reviewing 157 patients who received 500 mg of FCM on postoperative Day 1 (group reported in our earlier study²).
- We measured the Hemoglobin (Hb)
 - (1) Preoperatively (Preop-Hb), on
 - (2) Day 3 post TKA (Day3-Hb) and at
 - (3) 5 weeks(+ 1 week) post TKA (Week5-Hb)



METHODS

| | Control Group | Study Group |
|--|---------------|-------------|
| Total TKA | 353 | 302 |
| Included in study | 157 | 172 |
| Excluded from study | | |
| Bilateral Knees | 132 | 88 |
| Revision | 4 | 8 |
| Received Transfusion | 7 | 20 |
| Follow-up outside study period* | 53 | 14 |

*5week blood Report outside the window period [5(+1) weeks]



RESULTS

- **Table 1 - Demographic data.**

| | Control Group | Study Group | pValue |
|-----------------------------|----------------------|--------------------|-------------------|
| Age (Mean [SD]) | 67.9 [7.3] | 67.6 [8.1] | 0.68 [#] |
| BMI (Mean [SD]) | 31.2 [5.9] | 31.1 [6.0] | 0.82 [#] |
| Gender (Male) (N[%]) | 27 (17.2%) | 33(19.18%) | 0.67 [*] |
| Hypertension (N[%]) | 87 (55.4%) | 98 (57%) | 0.82 [*] |
| Diabetes (N[%]) | 29 (18.5%) | 40(29.1%) | 0.34 [*] |
| Thyroid (N[%]) | 27 (17.2%) | 23(13.37%) | 0.36 [*] |

- [#] Student's Unpaired t test
- ^{*}Fisher's Exact Probability test.

RESULTS

- Table 2- Comparison of Hb values between control and study group

| | Control group | Study group | pValue |
|-----------------|----------------------|--------------------|---------------|
| | Mean [SD] | Mean [SD] | |
| Preop-Hb | 12.8 [1.3] | 12.60 (1.18) | 0.33 |
| Day3-Hb | 10.4 [1.0] | 10.00 (1.1) | 0.006 |
| Week5-Hb | 12 [1.1] | 12.15 (1.2) | 0.23 |

- Study group –
Comparison of Preop-Hb and Week 5-Hb : p=0.0003
Comparison of Preop-Hb and Day3-Hb : p=0.0001

RESULTS

- Table 3- Comparison of change in Hb values between control and study group

| | Control group | Study Group | pValue |
|-----------------------------|----------------------|--------------------|---------------|
| | Mean [SD] | Mean [SD] | |
| Preop-Hb to Day3-Hb | 2.41 [1.05] | 2.60 [1.0] | 0.097 |
| Day3-Hb to Week5-Hb | (-)1.65 [0.97] | (-)2.12 [1.0] | 0.0001 |
| Preop-Hb to Week5-Hb | 0.76 [0.78] | 0.48 [0.9] | 0.0022 |



RESULTS

- Percentage of patients reaching preoperative Hb :
 1. Study group – 30.8%
 2. Control group – 13.4%
- Adverse event :
 1. Study group – No allergic reaction. 2 patients developed ecchymosis due to extravasation from IV line.
 2. Control group - 1 patient developed a minor rash on the chest area on completion of the injection which resolved with IV injection of antihistamine and steroid.



DISCUSSION

- Intraoperative FCM has shown to facilitate recovery of postoperative anemia in joint arthroplasty.³
- Postoperative FCM showed better Hb recovery in anemic patients post bilateral TKA.¹
- Routine use of 500 mg FCM on postoperative day 1 in all patients undergoing TKA showed improved recovery of Hb.²
- We found 1000 mg FCM to have an additive effect on recovery of Hb post TKA as compared to 500 mg.



CONCLUSION

- 1000 mg of intravenous FCM administered on the first postoperative day post TKA, further hastens the haemoglobin recovery as compared to 500 mg of FCM.
- More than twice the number of patients are able to achieve preoperative Hb values by 5 weeks post TKA.
- We observed no adverse events with 1000 mg of FCM.
- We recommend 1000 mg of intravenous FCM in all patients undergoing TKA to hasten the Hb recovery.



References.

1. Kim, M.S.; Koh, I.J.; Choi, K.Y.; Yang, S.C.; In, Y. Efficacy and Safety of Intravenous Ferric Carboxymaltose in Patients with Postoperative Anemia Following Same-Day Bilateral Total Knee Arthroplasty: A Randomized Controlled Trial. *J. Clin. Med.* 2021, 10, 1457. <https://doi.org/10.3390/jcm10071457>
2. Maniar AR, Mishra A, Sanghavi N, Maniar RN. Does Postoperative Intravenous Ferric Carboxymaltose Hasten the Recovery of Hemoglobin in Patients Post Total Knee Arthroplasty? *J Arthroplasty.* 2022 Jun;37(6S):S155-S158. doi: 10.1016/j.arth.2022.02.046. Epub 2022 Feb 21. PMID: 35202759.
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