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ORAL VERSUS INJECTABLE IRON THERAPY IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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ABSTRACT-- *In CKD patients anaemia develops in begining stages due to decrease in production of erythropoietin by both kidneys. Patients with chronic kidney disease are at higher risk of developing iron deficiency due to decreased dietary intake, frequently testing of blood, decreased GI absorption and inflammation. [2] Oral and injectable iron have their advantages and disadvantages. Advantages of oral iron therapy are Convenient, cheapest, Easy to use, Safe and acceptable. However there are some advantages also like less bioavailability due to first pass effect, not used during emergency, cause gastric irritation, Metallic taste, Discoloration of teeth, Black colored stool.Injectable iron therapy also having some advantages like used in severe iron deficiency anemia, unable to tolerate oral iron, noncompliance, unable to absorb iron from gastrointestinal tract. And disadvantages are pain and discoloration of skin at injection site, arthralgia, lymphadenopathy, urticarial rash and anaphylaxis, in patients with active infection (fever).*

Keywords*--chronic kidney disease, iron deficiency anemia, oral iron therapy,Injectable iron therapy*

I. INTRODUCTION

Chronic kidney disease is defined as abnormalities of kidney structure or function, present for >3 months, with decreased GFR <60 milliliters per minute per 1.73m^2. [1].In CKD patient due to decrease in production of erythropoietin will lead to anemia in early stages of CKD. Patients with chronic kidney disease are at higher risk of developing iron deficiency due to decreased dietary intake, frequently testing of blood, decreased GI absorption and inflammation. [2]

II. BACKGROUND/RATIONALE

There are many different modalities for treating anemia like erythropoietin, blood transfusion, oral iron and injectable iron. In the treatment of anemia iron therapy is important.

Oral and injectable iron have their advantages and disadvantages. Advantages of oral iron therapy are Convenient, cheapest, Easy to use, Safe and acceptable. However there are some advantages also like less

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bioavailability due to first pass effect, not used during emergency, cause gastric irritation, Metallic taste, Discoloration of teeth, Black colored stool.

Injectable iron therapy also having some advantages like used in severe iron deficiency anemia, unable to tolerate oral iron, noncompliance, unable to absorb iron from gastrointestinal tract. And disadvantages are pain and discoloration of skin at injection site, arthralgia, lymphadenopathy, urticarial rash and anaphylaxis, in patients with active infection (fever).

III. OBJECTIVES

To study the rise in the level of hemoglobin after oral versus injectable iron therapy after 4 weeks for better follow up and compliance.

To study the rise in serum ferritin level and various iron profile parameter after oral versus injectable iron therapy.

To study the rise in level of hemoglobin after oral versus injectable iron therapy in various stage of chronic kidney disease, gender and age group.

To compare the various adverse effect of oral versus injectable iron therapy in chronic kidney disease.

IV. METHODS

Study design: case control study

Setting: we take 150 cases of chronic kidney disease in Medicine department of AVBR HOSPITAL,SAWANGI between August 2018 to August 2020 who will meet the inclusion criteria will be studied.

Participants: Inclusion criteria

Patient with age more than 16 years of age fulfilling all of the following criteria

- with GFR less than 60 ml/min/1.73m^2 for more than 3 months duration
- Hb <12.0 gram per deciliter in females and < 13.0 gram per deciliter in males

Consent: patients giving consent and voluntarily willing to participate in study.

V. EXCLUSION CRITERIA

Acute Kidney InjuryHaemochromatosisHaemosiderosisAcute or chronic infectionsRheumatoid arthritisDecompensated liver disease

- Variables: Among both group like oral iron and injectable iron receiving group of patient, intravenous iron sucrose therapy had rise in both Hb and serum ferritin after therapy, whereas those treated with oral iron therapy had raises in hemoglobin without raise in iron stores.
- Hb <12.0 gram per deciliter in females and < 13.0 gram per deciliter in males

  Iron stores indicators below target (TSAT less than 30% and ferritin <500 μg/L either or both of the following.

Data sources/ measurement

we take 150 cases of chronic kidney disease in Medicine department of AVBR HOSPITAL,SAWANGI (meghe) wardha, Maharashtra.

Study size: Sample size formula with desired error of margin

$n= (Z \text{ alpha}/2)^2 \times P \times (1-P)/d^2$

where Z alpha/2= level of significance at 5%

That is 95% confidence interval=1.96 P = prevalence of anemia [4] = 90.39%=0.903 d = Desired error of margin 4%=0.04$n=1.96^2 x 0.9039 x (1-0.9039)/0.04^2$ =133.4n = 134

134 cases of chronic kidney disease is sample size according to formula but we take 150 cases of chronic kidney disease in Medicine department of AVBR HOSPITAL, SAWANGI

Quantitative variables: Hb <12.0 gram per deciliter in females and < 13.0 gram per deciliter in males; iron stores indicators below target (s-ferritin <500 μg/L) and TSAT <30% either or both of the following

Quantitative variables used to compare rise in these variables after giving oral and injectable iron therapies

VI. EXPECTED OUTCOMES/RESULTS

This case control study we take 150 patients 75 were cases and 75 were controls with giving oral and intravenous iron respectively. Between treatment groups there were no significant difference demographical conditions. As compared to iv iron therapy taken patient mean treatment compliance was lower in the oral iron therapy receiving patients. The Intravenous iron group had significant mean increase from baseline in ferritin, haemoglobin values.

The adverse effects was same in two groups. The gastrointestinal symptoms are the most common adverse effects

VII. DISCUSSION

CKD patient with anaemia on intravenous iron therapy have reduced gastrointestinal side effects than oral iron therapy so compliance is more. Patients who are receiving Intravenous iron like iron sucrose were able to increase their haemoglobin with increase in body iron determinants. IV iron sucrose was better than oral iron therapy and effective in replenishing iron stores as measured by serum ferritin and transferrin saturation values.

It is seems that there is lack of awareness and information regarding further management of end stage renal disease patient. [5-8]. Organ donation and kidney or renal transplant are the efficacious treatment for end stage kidney failure chronic kidney disease patient [9-12]. Awareness among people necessary about organ donation it can be done with the help of Mass media, religious leaders and political leaders when get involved [13-14] **.** Many articles were reviewed on different aspects and associated factors of this study [15-77].

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