

Clinical efficacy of Granulocyte apheresis using Hydroxyethyl Starch in AML patient: A case report

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Introduction

- Apheresis, or Hema pheresis, is an automated process for collecting blood components from donors.
- Granulocyte Apheresis specifically collects granulocytes from healthy blood donors.
- Bacterial and fungal infections significantly contribute to mortality and morbidity in neutropenic patients.
- The unrestricted use of antimicrobials has further exacerbated the issue, leading to drug-resistant strains across India.
- Research indicates that granulocyte transfusion therapy can effectively help restore neutrophil counts, aiding the resolution of infections in these patients.
- This study aims to assess the clinical efficacy of granulocyte transfusions in febrile neutropenic patients at our center.

Case History

- A 66 years old male patient diagnosed Relapsed AML received 1st cycle of high dose cytarabine induction chemotherapy on November 2023. Comes to our hospital on 10/12/2023 with chief complain of fever with chills and cough, not a/w abdominal pain, chest pain, bleeding from any site CBC : 6.4/200/6000, In View of Febrile Neutropenia and anemia.
- Patient was admitted in BMT recovery for Neutropenic Care. Inject able Antibiotics started, 1 unit PCV given. In view of Febrile neutropenia require to continue Neutropenic Care support.

MATERIALS AND METHODS

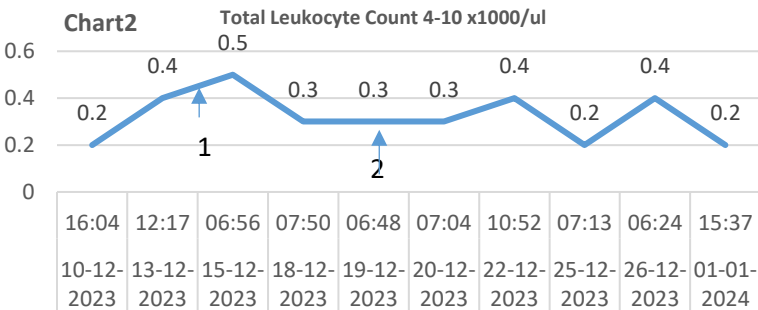
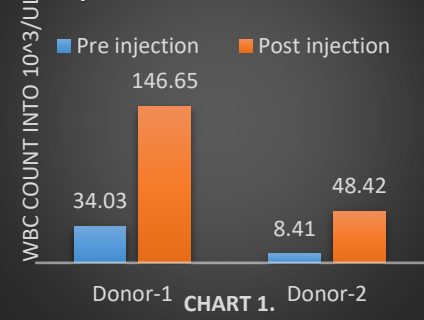
- This a case report presented in Department of Transfusion medicine at a Pramukhswami Medical College, Karamsad, Gujarat, India.
- Donors found fit for donation according to selection criteria by DGHS and who were willing to give written informed consent were included in report.
- There were total 2 procedure done for the same patient.
- In both procedures inj GCSF and inj Dexamethasone was given as stimulating agent to increase the WBC count of donor.
- Hydroxyethyl starch is used as sedi-menting agent to enhance separation of granulocytes from red cells to improve yields in both procedures.
- Pre and Post injection WBC count of donors are done and compared to see increment of granulocyte.
- MNC count of final products were noted to find out yield.
- Changes in patient's clinical symptoms and WBC count were noted to see efficacy of the Granulocyte concentrate.

Results

- Due to effect of Inj. GCSF and Dexamethasone in donors there is significant improvements in WBC count before procedure.
- In first procedure there is **Four** times increment in WBC count of donor from pre injection WBC counts(chart-1).
- In second procedure there is **Five** times increment in WBC count of donor from pre injection WBC counts (chart-1).
- In both procedures final yield of product was higher than recommended yield as per AABB standards(table-1).
- First product was transfused on 14/12/2023 and second transfusion 19/12/2023.
- There was increment in patient's WBC count and resolution of fever after both transfusion as shown in Chart 2.
- There was no any adverse event in donor or patient.



Increment in WBC count after Inj GCSF and Dexamethasone



Run values	Procedure 1	Procedure 2
Collection Preference	50	50
Packing Factor	1.6	1.6
Whole blood processed(ml)	5437	5480
Target Fluid Balance(%)	104	105
AC total	493	515
Final Product Volume	432	422
Ac in Collect	51	51
RBC in product(x10^6/ uL)	0.67	0.89
Platelet in product(x 10^3 /uL)	432	822
Wbc Count of Product(x 10^3 /uL)	126.77	49.05
Neutrophil %	81.8	58
GC Of Product(x 10^10)	4.47	1.78

Discussion

As per our experience it is found that there is increased granulocyte collection after use of Hydroxyethyl starch as sedi-menting agent which in turn leads to higher dose of granulocyte In final product leading to early resolution of clinical symptoms which is also found in study done by Price Th and colleagues and Kondo T and Colleagues.

Conclusion

Granulocyte transfusion is a valuable adjunct to antimicrobials and growth factors in treating neutropenic sepsis that is refractory to conventional antimicrobial therapy.

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