

Knowledge of various benign and malignant hematologic conditions and Attitude towards various treatment modalities including HSCT/BMT in a tier II/III city

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Abstract:

Hematology is a rapidly evolving discipline addressing diverse benign and malignant disorders, yet awareness among medical practitioners in tier II/III cities remains limited. Bone Marrow Transplantation (BMT), a transformative therapy for hematologic conditions, is often misunderstood, with gaps in knowledge regarding donor eligibility, procedures, and complications. To assess these gaps, a structured survey was conducted among members of the Indian Medical Association – Shivamogga, encompassing domains of general awareness, ethical considerations, procedural aspects, and complications. Despite a low online response rate, subsequent in-person discussions highlighted both strengths and limitations in current understanding. Findings revealed challenges faced by rural doctors, alternate medicine practitioners, and older generation physicians, including restricted access to training, infrastructure, and interdisciplinary platforms. The study underscores the urgent need for awareness programs, simplified resources, and collaborative efforts to bridge knowledge gaps, empower informed decision-making, and enhance accessibility of hematologic care and transplantation services in resource-limited settings.

1. INTRODUCTION

Hematology, a rapidly evolving branch of medicine, focuses on the diagnosis, treatment, and prevention of disorders affecting the hematopoietic system. As a specialized field, it addresses a diverse range of conditions, including anemia, coagulation disorders, hemoglobinopathies, leukemias, lymphomas, and other hematologic malignancies. The complexity and significance of hematology also, lies in its role as the cornerstone of understanding systemic diseases. Blood, as a vital fluid, acts as a mirror reflecting the health of an individual, making hematology an indispensable tool for comprehensive medical care.

With advancements in laboratory techniques, molecular diagnostics, and therapeutics, hematology is also a gateway to personalized medicine, providing targeted therapies based on genetic and cellular characteristics. Hematology, despite being a crucial and rapidly advancing branch of medicine, often lacks adequate understanding among certain groups of medical practitioners.

Bone Marrow Transplantation (BMT) has revolutionized the treatment landscape for numerous hematologic malignancies and benign conditions, offering hope and improved outcomes for patients worldwide.

2. NEED OF THE STUDY.

Many patients and even some healthcare professionals are unaware of the types of BMT— autologous (using the patient's own stem cells) and allogeneic (using stem cells from a donor). This lack of understanding can create apprehension and hesitation when BMT is suggested as a treatment option. Awareness about the intensive pre- transplant process, which includes chemotherapy, radiation, and the risks involved, is crucial for setting realistic expectations. There is a significant gap in the understanding of donor eligibility, procedures like harvesting peripheral blood stem cells, and the critical role of unrelated donor registries, which can help save lives when

family donors are unavailable. This gap in awareness poses challenges to patient care, early diagnosis, and effective treatment of hematologic disorders.

Aim: To assess the awareness and understanding of Bone Marrow Transplantation (BMT), including its procedures, indications, and complications, among members of the Indian Medical Association – Shivamogga. The study aims to identify knowledge gaps and promote informed decision- making to enhance the quality and accessibility of hematologic care within the medical community.

3. RESEARCH METHODOLOGY

3.1 Population and Sample

To address this, a comprehensive survey was conducted among the members of the Indian Medical Association – Shivamogga. Designed with the assistance of the Survey Monkey platform and disseminated via WhatsApp, the survey aimed to capture nuanced insights on key themes:

1. General Awareness: Exploring perceptions of BMT, hematologic malignancies, and donor- related perspectives – 25 questions.

2. Ethical Considerations and Indications: Examining both benign and malignant contexts for BMT – 15 questions.
 3. Procedure: Understanding the processes involved in bone marrow aspiration, biopsy, and transplantation – 10 questions.
 4. Complications: Highlighting challenges associated with Bone Marrow or Peripheral Blood Stem Cell Transplantation – 10 questions.
- With 60 questions across these domains, the survey utilized a user-friendly format, ensuring respondent

Table 1: Key Impactful questions in the Sections 1 and 2 of the questionnaire:

Key impactful questions in Section 1: General awareness - Bone Marrow Transplantation, Hematologic malignancies, Donor perception.		Key impactful questions in Section 2: Ethical Considerations, Indications of Bone Marrow Transplantation - Benign and malignant.	
Sl. No.	Question	Sl. No.	Question
3.	How familiar are you with hematologic malignancies?	1.	Certain types of anemias maybe treated without blood transfusions. Do you think it is ethical to transfuse blood for these indications?
6.	What do you believe are the main benefits of bone marrow transplantation?		
8.	How important do you think early diagnosis is for hematologic malignancies?	2.	Now if I tell you that transfusion has its own side effects do you think it is fair to transfuse blood for these indications?
12.	What are your main concerns regarding bone marrow transplantation? (Select all that apply)		
13.	How likely are you to recommend bone marrow transplantation to someone in need?	12	Certain conditions like acute leukemia and certain relapsed refractory chronic leukemia and lymphoma are treated with chemo-immunotherapy. Treatment is often consolidated with allogenic transplantation . That is patient's own stem cells are likely to be diseased. Hence stem cells from relatives/ unrelated matched donors/ half matched relatives are used. Do you think it is ethically ok to do this?
15/16	Are you willing to be a donor for an unknown/ known patient?		
20.	Have you pledged to donate any organ (cornea/liver etc.) or pledged to donate your corpse for the medical community or plan to do it?	14	Matched sibling donor is the most ideal donor for bone marrow or peripheral blood stem cell transplant. However, with the current technology half matched donor product can also give good results. Do you think it is a reasonable option for benign/ malignant hematological conditions that affect the longevity of patient and cause morbidity?
21.	Individual's inability to donate blood makes the individual unable to donate a bone marrow: True or False		
22.	To be registered in the any stem cell donor registry you need not provide a blood sample: True or False		

Table 2: Key Impactful questions in the Sections 1 and 2 of the questionnaire:

Key impactful questions in Section 3: Bone marrow aspiration, biopsy and transplantation - actual procedure.	Key impactful questions in Section 4: Complications of Bone Marrow or Peripheral Blood Stem Cell Transplantation.
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Sl. No.	Question	Sl. No.	Question
1.	Bone marrow aspiration. Select all that is true: Painful procedure done under local anaesthesia; Has to be done by a trained physician; Diagnostic procedure; Therapeutic procedure; Sample quality is not a criterion hence anyone can do this	1	Neutropenia is a common feature of chemotherapy. It is also seen post BMT/HSCT. Do you think in our present set up we can handle such cases ?
2.	Bone marrow biopsy. Select all that is true: Is an additional procedure done just to bill the patient and build hospital revenue; Gives additional information and is valuable in patient care; Needs special processing in specific fluids; Same as bone marrow transplantation.	2.	Cancer prevalence is increasing and number of people who undergo chemotherapy is high compared to before. Based on the current curriculum, do you think our next generation of doctors are well trained to handle such a situation?
3.	Hematopoietic stem cell transplantation. Select all that is true. Surgical procedure/Medical procedure	3.	What infections can occur during neutropenia? ?Bacterial, ?Viral, ?Fungal, ?Parasite
4.	Are Bone Marrow Transplantation and HSCT the same?	4.	Graft versus host disease affects : ?skin and mucosa; ?liver and gut; ?bones and hair, ?lungs
5.	Do you think HSCT also involves some chemotherapy medication?	5.	Graft versus leukemia effect is beneficial. (yes, no / other)
6.	Do you think HSCT involves some radiotherapy kind of treatment??	6.	Graft versus leukemia is same as Graft versus host disease. (yes, no / other)
9.	Does bone marrow transplantation require certain additional equipment or arrangements?	7.	Do you think the person who undergoes transplantation has to be immunised again?
10.	According to you what is the role of blood bank in the above mentioned procedures?	8.	Do you think gene therapy is an option for benign hematologic conditions? Elaborate
		9.	Do you think gene therapy is an option for malignant hematologic conditions? (yes or no). Elaborate
		10.	Are you interested in research in this field?

4. RESULTS AND DISCUSSION

STRENGTHS:

A well-structured and thoughtful survey targeting important topics in the field of Hematology and Bone Marrow Transplantation and related areas. The breakdown into sections based on themes—like general awareness, ethical considerations, procedural aspects, and complications—shows a comprehensive approach to gathering insights and opinions.

Including the option for anonymity and allowing participants to omit questions adds an ethical and considerate touch.

LIMITATIONS OF THE STUDY:

Due to the utilization of an online platform for data collection, the response rate was exceptionally low, with only 7 out of 533 participants providing feedback. Consequently, the ability to draw statistically significant or meaningful conclusions from this dataset is severely limited.

Following the initial phase of data collection, a secondary phase was conducted in person. However, during this phase, the responses were predominantly subjective and the discussions frequently deviated from the intended topic. Despite these challenges, the second phase proved to be effective in raising awareness about hematology and BMT/HSCT.

1. **Challenges Faced by Rural Doctors:** In rural areas, medical practitioners often operate in resource-limited settings where specialized knowledge, infrastructure, and diagnostic tools are scarce. The emphasis is largely on managing immediate and common illnesses, leaving complex fields like hematology underexplored. Lack of access to continuing medical education (CME), workshops, or specialized training further contributes to this knowledge gap, preventing rural doctors from recognizing early signs of blood disorders or understanding advanced therapies like bone marrow transplantation.

2. **Practitioners of Alternate Medicine:** Doctors from alternate medicine systems, such as Ayurveda, Homeopathy, and Naturopathy, traditionally focus on holistic approaches and may have limited exposure to specialized areas like hematology. While these systems offer valuable contributions to health, they often lack integration with modern medical advancements in hematology. The absence of collaborative platforms or interdisciplinary education can leave practitioners unaware of life-saving interventions and advancements, reducing their ability to guide patients effectively when hematologic issues arise.

3. **Older Generation Doctors:** For doctors from older generations, rapid advancements in medical fields like hematology can be challenging to keep up with. Many practitioners trained decades ago might not have had in-depth exposure to hematology during their medical education, as it was not as developed as it is today. While their wealth of experience remains invaluable, a lack of familiarity with newer diagnostic tools, treatments, and innovations such as stem cell therapies and molecular diagnostics can hinder their ability to adapt to the evolving landscape of hematologic medicine.

4. **Awareness of Complications of Bone Marrow Transplantation:** While BMT offers immense hope, it is not without risks. Awareness about the potential complications is essential for both healthcare providers and patients to prepare for challenges and ensure timely management.

5. **Acute Complications:**

a) Infections: A compromised immune system post-transplant increases susceptibility to bacterial, viral, and fungal infections. Public and practitioner awareness of stringent hygiene practices and prophylactic treatments can reduce risks.

b) Graft-versus-Host Disease (GVHD): In allogeneic transplants, GVHD is a potentially life-threatening complication where the donated cells attack the recipient's body. Many people are unaware of symptoms, such as skin rashes and gastrointestinal issues, and the importance of early detection.

6. **Chronic Complications.** Long-term issues like infertility, secondary cancers, or organ dysfunction can significantly impact the quality of life of survivors. Educating patients about these risks allows for better psychosocial adjustment and long-term monitoring. **Financial and emotional strain:** The high cost of treatment and the psychological toll on patients and families are often overlooked but are critical aspects requiring attention and support systems. By increasing awareness about these complications through targeted campaigns, educational initiatives, and counseling, the medical community can empower patients and their families to make informed decisions, navigate the transplant journey with confidence, and improve overall quality of care.

5. CONCLUSIONS:

FUTURE DIRECTION:

Bridging the Gap

Addressing these gaps requires a multifaceted approach:

1. **Awareness Programs:** Organizing CMEs and workshops tailored for rural doctors, alternate medicine practitioners, and older generation doctors to provide hands-on training and knowledge updates.

2. **Collaborative Efforts:** Encouraging interdisciplinary communication to integrate alternate medicine approaches with hematology advancements.

3. **Accessibility:** Expanding access to diagnostic tools and telemedicine services for rural areas.

4. **Simplified Resources:** Developing easy-to-understand guides and visual aids to help doctors unfamiliar with hematology grasp key concepts.

5. **By fostering a culture of continuous learning and collaboration,** the medical community can ensure that hematologic care reaches every corner of society, saving countless lives in the process.

By increasing awareness about the complications of Bone Marrow Transplantation through targeted campaigns, educational initiatives, and counseling, the medical community can empower patients and their families to make informed decisions, navigate the transplant journey with confidence, and improve overall quality of care.

II. ACKNOWLEDGMENT

IMA – SHIVAMOGGA MEMBERS.

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