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Perspective

HAEMATOLOGY! Are we ready for an ageing population?

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Key words: ageing population, haematology, individualized care, low-resource setting, healthcare adaptation

Abstract

The global population is ageing rapidly, with significant implications for healthcare systems, particularly in haematology. By 2050, it is projected that two-thirds of individuals over 60 years of age will reside in low and middle-income countries, necessitating adaptations in haematological practices to address the unique challenges faced by older adults. It is important to understand the complexities of managing haematological conditions in the elderly, emphasizing the importance of individualized care, multidisciplinary collaboration and resource-conscious approaches. This article outlines the key strategies for adapting haematology practices for the ageing population, focusing on personalized assessments, tailored diagnostic approaches, individualized treatment plans and early detection of haematological disorders. Emphasis is placed on resource-conscious treatment plans in low-resource settings, strengthening prevention efforts, and building resilient health systems. The implementation of comprehensive geriatric assessments and multidisciplinary approaches can enhance patient outcomes. Case reports illustrate the importance of addressing co-morbidities, polypharmacy, social issues and cultural beliefs leading to nutritional deficiencies in elderly patients. Collaboration among healthcare professionals within hospitals as well as in community settings is essential for effective management. Adapting haematology for an ageing population requires a shift towards individualized, patient-centered care. In low socio-economic contexts, cost-effective solutions and community involvement are crucial for equitable access to haematology services. This approach not only addresses medical challenges but also fulfils a moral obligation to reduce health disparities globally.

Introduction

Aged population is considered as those over 60 years old, according to the World Health organization (WHO). In 2020, the aged population of the world was 1 billion and by 2030 it will increase to 1.4 billion and will double to (2.1 billion) by 2050, with those above 80 years trebled between 2020 to 2050 to reach 426 million[1]. Even though population ageing started in the high-income countries (for example in Japan 30% of the population is already over 60 years old), it is now low- and middle-income countries that are experiencing the greatest change[2]. By 2050, two-thirds of the world's population over 60 years will live in low- and middle-income countries. Within South Asia, Sri Lanka demonstrates the most rapid ageing process. By 2042, almost one out of every four persons is expected to be elderly[3,4].

At the biological level, ageing results from the impact of the accumulation of a wide variety of molecular and cellular damage over time. This

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leads to a gradual decrease in physical and mental capacity, a growing risk of disease and ultimately death. In addition to these biological changes, ageing is also associated with other life changes such as retirement, relocation to more appropriate housing and the death of friends and partners[2]. According to the United Nations the ageing population is those over 65 years which constitutes 10.3% of the global population at present and is expected to increase to 20.7% in the year 2074[1]. **Increased life expectancy and decreased fertility rates** are the primary reasons identified for these figures and this places a significant strain on healthcare systems, social security programs and workforce[1].

As the global population ages, haematology practices too, must evolve to meet the unique challenges and needs of older adults[5]. This demographic shift has led to an increase in age-associated haematological disorders, such as anemia, myelodysplastic syndromes (MDS), clotting abnormalities and haematological malignancies such as leukemia and embrace a multidisciplinary and patient-centered approach[6].

Objective of this article is to highlight the complexities of managing haematological conditions in the elderly, emphasizing the importance of individualized care, multidisciplinary collaboration, and resource-conscious approaches.

Thus, keeping the above in mind, the following key methods can be incorporated to adapt haematology practices for an ageing population.

1. Personalized and comprehensive assessment

The elderly often present with multiple comorbidities, polymedication and limitations of functions that complicate haematological care. Comprehensive geriatric assessments, which include physical, cognitive, nutritional and social evaluations, must be included into haematology practice. When using such a comprehensive approach, this will ensure treatment plans to align with patients' overall health status and quality-of-life[7].

2. Tailored diagnostic approaches

Diagnostic protocols should be designed for age-related physiological changes. For example, baseline hemoglobin levels tend to decline with age, requiring careful interpretation of anemia thresholds. In addition, bone marrow biopsies and other invasive procedures may require modification or use of alternative techniques to minimize discomfort and risks[8].

3. Individualized treatment plans

Treatment protocols must be designed to balance efficacy with tolerability. Older patients may not tolerate aggressive therapies due to generalized weakness or comorbid conditions. Dose adjustments, supportive care (e.g. use of growth factors, transfusions), and less toxic alternatives like oral or targeted therapies should be considered[9]. Engaging patients in the decision-making process regarding their treatment ensures their preferences and values are respected.

4. Prevention and early detection

Preventative measures should be given priority, including regular screening for nutritional deficiencies (e.g. iron, vitamin B12, and folate), thrombotic risks and early detection of hematological malignancies by close monitoring of symptoms and blood counts which can improve outcomes[10].

5. Management of age-specific risks

Older adults are more susceptible to thrombotic events and bleeding complications. Anticoagulation therapy must be carefully managed, weighing the risks of clotting against bleeding especially as most elderly patients have some degree of renal impairment which may necessitate dose reduction of the commonly used oral anticoagulants[11]. Therefore, collaboration with geriatricians and cardiologists can help optimize anticoagulation, particularly in patients with atrial fibrillation.

6. Palliative and supportive care

Palliative care should be commenced early for elderly patients with advanced haematological malignancies. While management of symptoms

like fatigue, pain, and dyspnea improves quality of life, providing emotional and psychological support to patients and caregivers is of equal importance[12].

7. Education and training

Healthcare workers in haematology should be trained to understand the complexities of ageing, such as recognizing geriatric syndromes, managing frailty and addressing ethical issues like end-of-life care. Multidisciplinary team effort ensures comprehensive patient management[13].

8. Research and innovation

The ageing population necessitates active research into geriatric haematology. Clinical trials should actively include older adults to generate age-specific data. Novel research into biomarkers for frailty, minimally invasive diagnostic tools, and therapies tailored to geriatric physiology are mandatory for aged care[14].

How can haematology practice be adapted for an ageing population in the Low Socio-economic context?

With the prediction of 2/3rd of the world population over 60 to be living in low-middle income countries[1], I would take this opportunity to add to this discussion as to what measures can be adopted in addition or in place to the above in respect of the ageing population in limited resource setting, this being my experience coming from a low-middle income country. In such settings, it is my belief that the following would enhance the haematological management of the elderly.

1. Individualized and resource-conscious treatment plans

Resource limitations necessitate prioritizing affordable and sustainable treatment options. Generic medications, simplified chemotherapy protocols, and oral formulations of drugs can improve accessibility. Collaboration with global health organizations and non-governmental organizations (NGOs) can help subsidize essential medicines, such as anticoagulants, iron supplements, or chemotherapy agents[15].

In such limited resource settings task-sharing with trained nurses, community health workers, and pharmacists can extend the reach of haematology services. Simple and clear protocols for managing common conditions like anemia or thrombosis can empower primary care providers to deliver effective care.

2. Strengthening prevention and early detection

Prevention is particularly important in resource-limited settings. Public health campaigns focused on addressing malnutrition, preventing infections like malaria (a common cause of anemia) and promoting immunization can reduce the burden of haematological diseases. Low-cost interventions, such as iron and folic acid supplementation programs, can address common deficiencies in older adults[16].

Early detection efforts can be promoted through community-based screening programs using simple tests like full blood count (FBC) and peripheral smear analysis. Training primary care providers to recognize early signs of haematological conditions will ensure timely referral to specialists[17].

3. Building resilient health systems

Strengthening health systems is the ultimate solution for sustainable care. This includes improving healthcare infrastructure, increasing the availability of trained haematologists, and ensuring a steady supply of essential medicines and diagnostic tools. Collaborations between governments, private sectors and international organizations are essential to achieve this goal[18].

Personal experiences in haematology for the elderly population

I would take this opportunity to highlight a few cases of our experiences and challenges we have encountered while working with elderly patients.

1. Managing anemia in elderly patients

We encountered 70-year-old female patient who presented with severe fatigue and pallor. Upon conducting a comprehensive assessment, we discovered she had iron deficiency anemia due to

chronic gastrointestinal bleeding due to a jejunal tumour which was detected due to examination of her stools for occult blood and upper and lower gastrointestinal endoscopy. This case highlighted the importance of thorough history-taking, physical examination and early noninvasive tests such as FBC, peripheral blood smear and stool tests as mentioned which brought us closer to the diagnosis without too much delay. We learned to consider not only the haematological aspects but also the patient's dietary habits and potential sources of blood loss. The treatment involved iron supplementation and addressing the underlying cause, which required collaboration with a gastroenterologist and surgeon.

2. Addressing polypharmacy

A 68-year-old male patient with multiple comorbidities, including hypertension, diabetes, chronic kidney disease (CKD) and atrial fibrillation, was on several medications, including anticoagulants. He presented with unexplained bruising and occasional nosebleeds.

This situation underscored the challenges of polypharmacy and the multiple comorbidities in the patient. We had to carefully review his medication regimen, considering the drug interactions, patient's excretory functions because of the CKD and cumulative effects of anticoagulants. We collaborated with the primary care physician to adjust his medications including doses ensuring that we balanced the need for anticoagulation with the risk of bleeding.

3. Palliative care for advanced haematological malignancies

We worked with an 80-year-old patient diagnosed with acute myeloid leukaemia (AML) who was not a candidate for aggressive treatment due to frailty and comorbidities.

This experience taught us the importance of palliative care and symptom management. We focused on providing comfort measures, managing pain and addressing emotional and physical needs. Engaging in discussions about end-of-life care and respecting the patient's wishes was a profound learning experience that emphasized the need for compassion in haematology.

4. Early detection of haematological disorders

During a medical check-up event, we encountered a 65-year-old woman who had no prior medical history and no clinical findings on examination. Her FBC revealed thrombocytopenia (platelet count was 70 x 10^9/L) which was finally diagnosed as early non-alcoholic chronic liver cell disease (CLCD).

This case reinforced the significance of frequent screening in the elderly population. We learned the value of medical check-ups and education in identifying potential haematological issues before they escalate. This experience motivated us to advocate for regular medical check-ups in elderly population.

5. Collaboration with multidisciplinary teams

We participated in a case conference for a 67-year-old male patient with CLCD after a cardiac bypass graft (CABG) who had developed a proximal deep vein thrombosis on the 3rd day post operation and an acute kidney injury (AKI) which required a comprehensive treatment plan involving haematology, nephrology, medical and cardiac teams in managing the anticoagulation in the presence of renal and liver compromise.

This experience highlighted the importance of a multidisciplinary approach in managing complex cases. We learned to appreciate the diverse perspectives and expertise that each team member brought to the table, ultimately leading to a more holistic and effective treatment plan for the patient.

6. Cultural / religious sensitivity in treatment decisions

We cared for a 72-year-old woman diagnosed with aplastic anaemia who was hesitant to accept blood transfusions due to religious beliefs.

This situation taught us the importance of personal, cultural and religious sensitivity and effective

communication in haematology. We engaged in open discussions to understand the patient's beliefs and worked together in exploring alternative treatment options that aligned with their values while still addressing their medical needs.

7. Addressing nutritional deficiencies

We encountered an 80-year-old male who lived alone and presented to the outpatient department due to severe fatigue and weakness. Upon questioning, it was found that he had difficulty accessing nutritious food due to mobility issues. He was admitted and comprehensive laboratory tests revealed vitamin B12 deficiency anaemia.

This case highlighted the association of nutrition and haematology in the elderly. We coordinated with a dietitian to develop a nutritional plan that included vitamin B12 supplementation and dietary modifications that can be obtained easily. This experience reinforced the importance of addressing social determinants of health and the importance of community-based management in haematology.

These personal experiences in the field of haematology for the elderly population have significantly shaped our understanding and approach to patient care. They have reinforced the importance of individualized treatment, comprehensive assessments, and the need for collaboration among healthcare professionals. Each case has provided valuable lesions that we carry forward in our practice, ultimately aiming to improve outcomes and quality of life for elderly patients with haematological disorders.

Discussion

Age-related hematologic changes are accentuated by a decline in marrow cellularity, increased risk of myeloproliferative disorders and anemia, and a decline in adaptive immunity[19]. The exact mechanisms that produce these changes remain undefined.

In 2020, about 600 000 people 65 years and above were diagnosed with a haematological malignancy worldwide. This number is expected to increase to almost 1 million by 2040, with the largest growth taking place in regions with less developed economies[6]. Globally, health-care systems are not prepared to face this foreseen increase in the burden of haematological malignancies among the elderly and geriatric oncology and haematology are not properly developed in most low-income and middle-income countries, as well as in many community settings in high-income countries[6].

As mentioned, **anaemia** is one of the commonest haematological problems affecting 12% of the elderly >65 years living in the community with the percentage increasing to 40% and 47% in hospitalized and elderly living in nursing homes respectively[8]. The most common anemias in the older people are anaemia caused by nutritional deficiencies, anaemia of chronic inflammation, and unexplained anaemia of aging. In addition, anaemia can be due to other bone marrow disorders and various non-haematological disorders, necessitating a systematic approach to the evaluation of the cause for anaemia[20].

Thrombocytopenia can be identified as another common haematological disorder seen in the elderly. Mild thrombocytopenia is a frequent presentation due to an idiosyncratic side effect of cocktails of drugs that is a common feature in most elderly patients[21]. In addition, disorders affecting the bone marrow such as **MDS, myelofibrosis** occurring in the older patients and infiltration by haematological malignancies, thrombocytopenia can occur in isolation or together with other cytopenias[22]. Immune aetiology for thrombocytopenia is now becoming a common presentation too[23]. Such thrombocytopenia can occur with or without bleeding and thereby, stress the importance of proper evaluation in determining the aetiology.

Bleeding is another common presentation in the older population which again can be due to the frequent use of pain killers, anticoagulants and blood thinners for ischemic heart disease, arrhythmias and thrombotic events which are common in these patients and also development of acquired bleeding disorders such as acquired von Willebrand disease, acquired haemophilia and other rare factor deficiencies as para neoplastic syndromes or associated with clonal/ malignant

haematological disorders[24]. Therefore, careful focused evaluation of elderly patients presenting with bleeding is imperative to prevent, delay and unnecessary investigations in their diagnosis and management.

As **most haematological clonal/ malignant disorders** are common in the older population, it is imperative that all elderly patients presenting with a bi-cytopenia or pancytopenia are considered as potential candidates for an underlying bone marrow pathology and thereby evaluate the patient with minimally invasive investigations initially which would direct the clinician to proceed with further specific investigations in arriving at a diagnosis without undue delay and expense[25].

All the above clearly brings out the fact that education of health workers, especially in haematology, acting with a high degree of suspicion and a multidisciplinary approach is paramount in the management of the elderly patients with haematological disorders.

Conclusion

Adapting haematology for an ageing population requires a paradigm shift toward individualized, multidisciplinary, and patient-centered care. By addressing the unique challenges of older adults, haematologists and healthcare workers can enhance outcomes, improve quality of life, and ensure equitable care for this growing population. In respect of low socioeconomic countries, focusing on cost-effective solutions, capacity building, prevention, and community involvement and most importantly empathy towards the elderly is the way forward. As such haematologists and health-care workers can deliver meaningful care to older adults despite resource limitations. Ensuring equitable access to haematology services is not just a medical challenge but a moral obligation to address the disparities in global health.

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