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The Fragile Web of Care: Ethnicity, Poverty, and Language in Acute Leukaemia

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Sociodemographic factors are associated with survival in acute leukaemia in studies across different countries. The potential causal links are multiple and suggest many relatively simple interventions that have received inadequate research and attention. This article surveys the data for 3 key sociodemographic factors, considers an illustrative case, and suggests a model to conceptualise how some of these inequities might be understood and addressed.

Acute leukaemia is at the vanguard of precision medicine. Most clinical and scientific writing and discussion assume that a small number of biological factors should accurately predict outcome: cytogenetic and molecular genetic abnormalities, presenting white cell count and patient fitness for treatment. This is represented schematically in Figure 1 by a set of balance scales. One weighing plate carries the biological risk factors of a particular case and the other plate holds factors about a patient's fitness for treatment. At the fulcrum, the essential question is "how intensively should we treat this particular leukaemic subtype, and can this patient's body tolerate the treatment?".

The reality is more complex. Multiple sociodemographic factors affect outcomes and are inadequately addressed by the balance scale model. Consider ethnic differences—a recent study of over 25 000 adult acute myeloid leukaemia (AML) patients in the United States demonstrated a 3-year survival of 34% in Black patients compared with 43% in White patients, despite no significant difference in baseline genetic risk categorisation and a "younger" median age in the Black patient group. Whereas there was a clear survival advantage for White patients with an nucleophosmin (*NPM1*) mutation compared with those with wild type *NPM1*, this advantage did not exist in the Black patient group.[1] Inferior survival has been demonstrated in other ethnic minority groups including Black, Hispanic, and Asian children treated for acute lymphoblastic leukaemia (ALL) in the United States[2]; Bedouin children treated for ALL in Israel[3]; and a historical cohort of South Asian children treated for ALL in the United Kingdom[4].

Poverty has also been shown to strongly predict poorer outcomes in acute leukaemia. Californian children with ALL living in a neighbourhood with lower socioeconomic status (SES) had a 39% higher risk of death compared with children living in high SES areas within the same state.[2] Lower SES also predicted inferior survival in a paediatric ALL cohort in India,[5] an adult ALL cohort in England,[6] and an adult AML cohort in France.[7]

Limited English proficiency (LEP) describes people who are not fluent in spoken English but who will often speak other languages proficiently. Having LEP is associated with reduced survival in pancreatic cancer[8] and higher risk of treatment failure in head and neck cancers.[9] There are no published studies on LEP and acute leukaemia mortality, but a US study of Hispanic families in a paediatric stem cell transplant setting showed that parental LEP was significantly associated with prolonged hospitalisation.[10]

What mediates the relationship between sociodemographic factors such as ethnicity, poverty, and LEP with acute leukaemia outcomes? There is a risk that we return to the balance scale model and try to fit sociodemographic disparities to underlying disease biology or patient fitness for treatment alone. The issues are far broader. The following case from a UK hospital demonstrates some of the complexities faced by a migrant patient from an ethnic minority, with no financial resources, and with limited English language proficiency.

A 45-year-old homeless asylum seeker from South Asia was diagnosed with Philadelphia-negative ALL and commenced emergency treatment with intensive chemotherapy. He had fled a conflict zone several years before and had limited English language abilities. His second phase of treatment was delayed by around 2 months—initially by questions around his eligibility for National Health Service (NHS) care, then by a lack of safe discharge accommodation, and finally by being uncontactable while based in temporary accommodation situated far from the hospital. Following the delayed second phase of induction chemotherapy, a bone marrow aspirate

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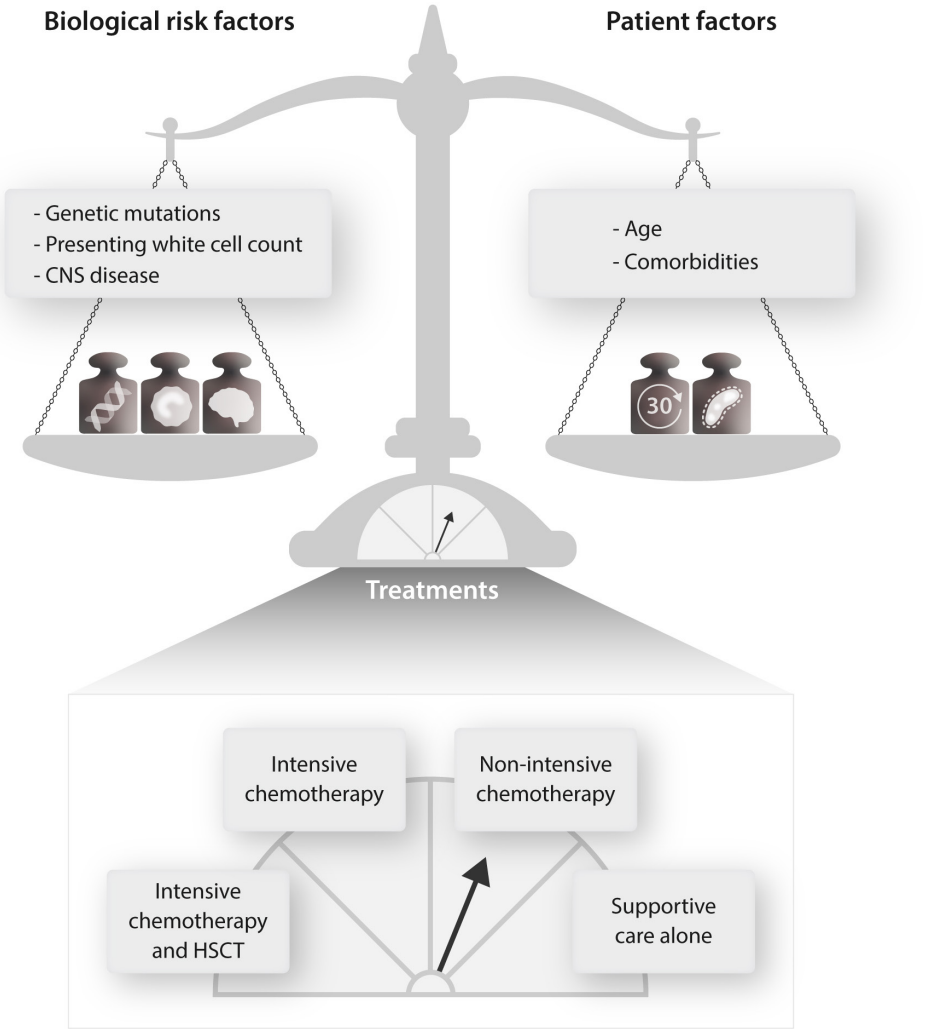

Figure 1. The balance scale model represents the dominant approach to the care of patients with acute leukaemia. Additional factors may be added to either side of the balance but will almost always be biological. The balance scale captures much of the important information for some patients but misses necessary conditions and factors for the care of others. CNS = central nervous system; HSCT = haematopoietic stem-cell transplant.

showed refractory disease. He was salvaged with inotuzumab ozogamicin but was deemed to be too unreliable to be a candidate for allogeneic haematopoietic stem cell transplant (HSCT). His disease relapsed again, and he returned to his country of origin to be reunited with his family shortly before he died.

This case demonstrates disadvantages faced at 3 levels. Firstly, at the "health care system level": even in a publicly funded healthcare system such as the UK NHS, not all patients are eligible for free healthcare and the uncertainty created by this can create delays at crucial treatment junctures. In other nations, privately funded healthcare creates barriers for those without sufficient money or insurance. Furthermore, had he been deemed to be a candidate for HSCT, this patient may have faced further structural barriers. Not only are non-White patients less likely to have a matched unrelated donor, but even suitable related donors who live abroad can be delayed or denied from traveling to donate their stem cells due to visa restrictions or financial limitations. Existing data demonstrates that patients of lower SES and those from minority ethnic groups have lower utilisation of intensive chemotherapy and HSCT in both AML and ALL.[11] Furthermore, even the trial data underpinning treatment decisions is not representative—acute leukaemia clinical trials recruit disproportionately low numbers of ethnic minority patients, and these enrollment disparities are increasing over time.[12]

The second disadvantage was at the "level of the clinical encounter" with healthcare providers. This patient was thought to comprehend more English than he did, and part of the delay in his treatment was due to his own lack of understanding of the urgency of further chemotherapy. More time was needed to build a shared understanding of his disease and its treatment. The conclusion that he was "too unreliable to be a transplant candidate" also demonstrates the crucial context of trust. How much of "unreliability" is the intrinsic property of a patient, and how much is it a failure by clinicians to build trust and shared understanding across cultural and linguistic divides?

Finally, this case demonstrates disadvantages faced "as an individual", not directly related to healthcare systems or providers, but nevertheless making his treatment riskier. He was initially homeless and had no financial resources to support himself. The accommodation eventually provided for him was distant to the hospital and was in a shared hostel setting with a high risk of contracting infections. He lacked family support and had no one external to the hospital who could advocate for him around treatment eligibility or to help him research his options. He had family in his country of origin towards whom he had ongoing financial obligations but missed the emotional and psychological support that their presence would have brought.

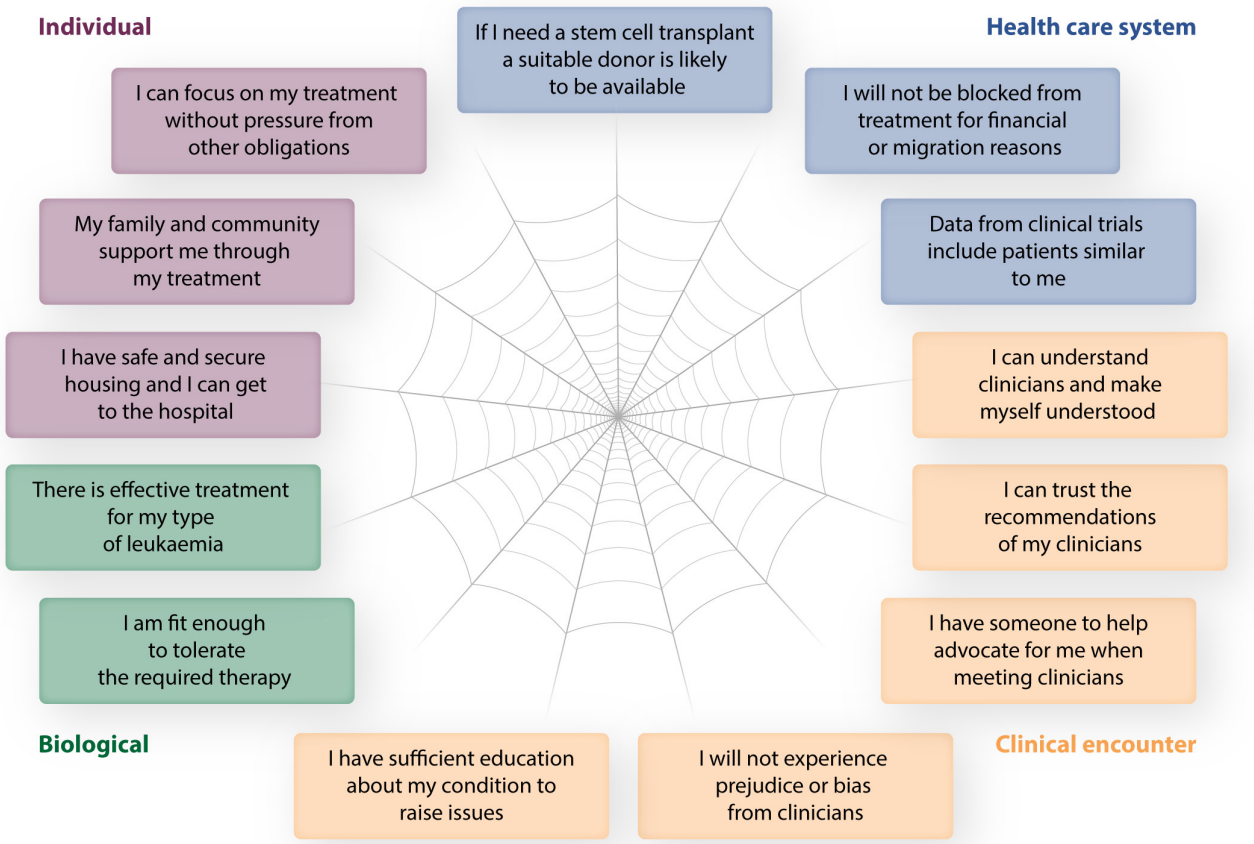

Figure 2. The web of care model represents some of the wider conditions necessary for a patient with acute leukaemia to receive good care. Conditions are categorised by colour into those at the level of the healthcare system, the clinical encounter, the individual's circumstances, and those that are primarily biological. If any individual thread (condition) is weakened or ruptured, the whole web of care becomes more precarious.

Figure 2 is a different way to visualise the patient with acute leukaemia, represented as being held in a web rather than upon weighing scales (c.f. Fig. 1). The web is chosen to represent the inherent fragility in the care we provide—even without any other disadvantages, threads can break suddenly, leading to death, or complications. Each radial thread represents an element or presupposition in the care of a patient with acute leukaemia. The threads are difficult to fully disentangle from one another and interlink in multiple ways. The loss of any individual thread may not be catastrophic but makes a patient's care more hazardous. To be of an ethnic minority, of lower SES or to have low English proficiency can disrupt multiple threads of the web and their connections. The web could also be dislocated by low educational ability, religious affiliation, profession, age, or gender.

How would an acute leukaemia service be designed to care for patients in the most fragile situations? Some changes would be easy and low-cost compared to treatment expenditures—such as addressing the paucity of translated haemato-oncology written materials[13] or better usage of medical interpreters. We can learn from colleagues in haemoglobinopathy and HIV services who work closely with colleagues in psychology, social care, and community nursing to give holistic support, including through home and community visits.

Other changes are important but more difficult to address. One challenge is to address barriers to care that are based on migration status or ability to pay and to make funding available to reduce financial hardship that prevents patients attending for treatment. Ensuring that trial data is relevant to all patients requires more diverse trial enrollment—this must be a priority.[12] Clinicians should also examine their own unconscious biases that impact our assessment of people who are different to us; these biases significantly contribute to breakdown in trust with patients, result in poorer care, and may contribute to discrepancies in leukaemia survival.

Fundamentally, health systems and haemato-oncology departments have been mostly developed and operated by people with relative financial security, with advanced language proficiency and health literacy, and who are often from the majority ethnic group of their country. Even with the best intentions, we will not have sufficient collective imagination to address sociodemographic disparities until our practice is led and informed by people of varied ethnic, socioeconomic, and linguistic backgrounds.

Disclosures

The author has no conflicts of interest to disclose.

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