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Title: Diagnostic delay in AYA Hodgkin Lymphoma patients. Does it exist? A comparative analysis across all ages.

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Introduction: Many subtypes of lymphoma exist and are grouped under Hodgkin and non-Hodgkin lymphoma. Hodgkin Lymphoma (HL) is rare and is more common in the AYA (Adolescents and Young Adults) population.

Diagnostic delay is widely reported as an important contributing factor to poorer outcomes for AYA oncology patients, when compared to patients in other age groups with similar diagnoses. However, studies show that diagnostic delay can affect survival outcome differently, depending on the tumour type and various other factors. A summer studentship looking at diagnostic delay in sarcoma patients showed that AYA patients had a longer pre-diagnostic symptom interval (PDSI) when compared to Paediatrics with the same diagnosis.

Aim:

To establish the time from the first recognized symptom to the time of first treatment for 20 HL patients from each of paediatric (0-14 years), AYA (15-24 years) and adult (>25 years) oncology patient groups. To also identify additional factors that may have an effect on the total symptom intervals within each age stratified group.

Impact: (in lay terms)

This study has shown that AYA patients with HL take longer to report their symptoms to a health care professional (HCP), which is a finding that is consistent with AYA Sarcoma patients. It may lead to further studies in areas that explore cancer symptom awareness education and questions raised towards the true association between diagnostic delay and survival outcome.

Method:

A minimum of 60 HL patient medical files from the Southern DHB and Canterbury DHB were analysed. This patient pool would represent patients across all age groups: Paediatric, AYA and adult. Relevant dates were extracted to characterize total symptom interval and the following time intervals:

- *Patient delay*: Time from first recognized symptom to first presentation to a HCP.
- *Referral delay*: Time from first presentation to a HCP to first specialist appointment with Haematology/Oncology (Haem/Onc) with the suspicion of cancer.
- *Haematologist/Oncologist delay*: Time from first specialist appointment to commencement of treatment.

Additional information collected included patient demographics, histological subtype of HL, histology and immunohistochemistry, lymph nodes and extranodal sites, disease stage, symptoms, treatment received and relapse. Levels of CRP, ESR, LDH, WBC and Hb count at time of diagnosis were also recorded. Data from 67 patients were recorded: 18 paediatrics, 27 AYA and 22 adults.

Results:

The median symptom intervals for paediatrics, AYA and adults were 105.5, 113 and 111.5 days respectively. Even though the total median symptom intervals for AYA and adults were similar, individual contributing delay intervals differed.

AYA has the longest patient delay compared to other age groups, which is consistent with the Sarcoma project's findings. The median patient delay for paediatrics and adults were 60 and 45 days respectively. Adults had the longest referral and haem/onc delay of 50.5 and 16 days respectively, when compared with Paediatrics (36 and 9.5 days) and AYA (18 and 15 days). Findings showed that time from first GP visit to referral being sent was an important factor contributing to referral delay seen across all age groups.

Total symptom intervals within other parameters that may have an effect on the total symptom interval were compared. For example, lymphocyte-depleted HL had the longest median symptom compared to other disease subtypes. Patients presenting with B symptoms (weight loss, night sweats, fever, pruritis, fatigue and generalized weakness) had longer median intervals compared to other symptoms. Other prognostic factors related to HL were also looked at. These included levels of CRP, LDH, WBC and Hb count at the time of diagnosis. Paediatrics had the highest median CRP and LDH level when compared with AYA and adults.

Conclusion:

Most of the parameters studied were not found to confound the association between AYA and its total symptom interval. However, 37% of the AYA age group presented with B symptoms, which is correlated with a longer symptom interval. AYA patient delay could be explained by developmental differences specific to this age group. It may have led to reluctance in seeking medical help and not offering enough information needed to confirm a diagnosis. Paediatrics had the shortest total time interval which may be explained by the high CRP and LDH level prompting HCP to act sooner, shortening the time interval. Contributing factors to referral and haem/onc delay in adults may be explained by the low CRP and LDH level and having a greater number of lymphocyte-depleted HL patients. These are factors correlated with longer symptom intervals.

There were limitations to this study. The sample size was small, especially for Paediatrics. Since HL is rare, having a larger nationwide patient pool may increase generalizability. Due to no access to GP notes, dates regarding the first HCP visit may not be accurate. To remain consistent, dates of Fine Needle Aspiration (FNA) or first abnormal blood test result done in the community were used instead.