No survival benefit associated with routine imaging for classical Hodgkin lymphoma in complete remission: A Danish-Swedish population-based study

Tarec C. El-Galaly,[1,8,9] Lasse H. Jakobsen,[1,6] Peter d. N. Brown,[2] Daniel Molin,[3] Karen J. Mylam,[4] Johan Linderoth,[5] Hans E. Johnsen,[1,8,9] Martin Bøgsted,[1,7,9] Mats Jerkeman,[5*] and Martin Hutchings[4*]

1. Department of Hematology, Aalborg University Hospital, Denmark; 2. Department of Hematology, Rigshospitalet, Copenhagen University Hospital, Denmark; 3. Section of Oncology, Department of Immunology, Genetics and Pathology, Uppsala University Hospital, Sweden; 4. Department of Hematology, Odense University Hospital, Denmark; 5. Department of Oncology, Lund University Hospital, Sweden; 6. Department of Mathematical Sciences, Aalborg University, Denmark; 7. Unit of Clinical Biostatistics, Department of Clinical Medicine, Aalborg University, Denmark; 8. Department of Clinical Medicine, Aalborg University, Denmark; 9. Clinical Cancer Research Center, Aalborg University Hospital, Denmark

*Contributed equally to the present work

Background

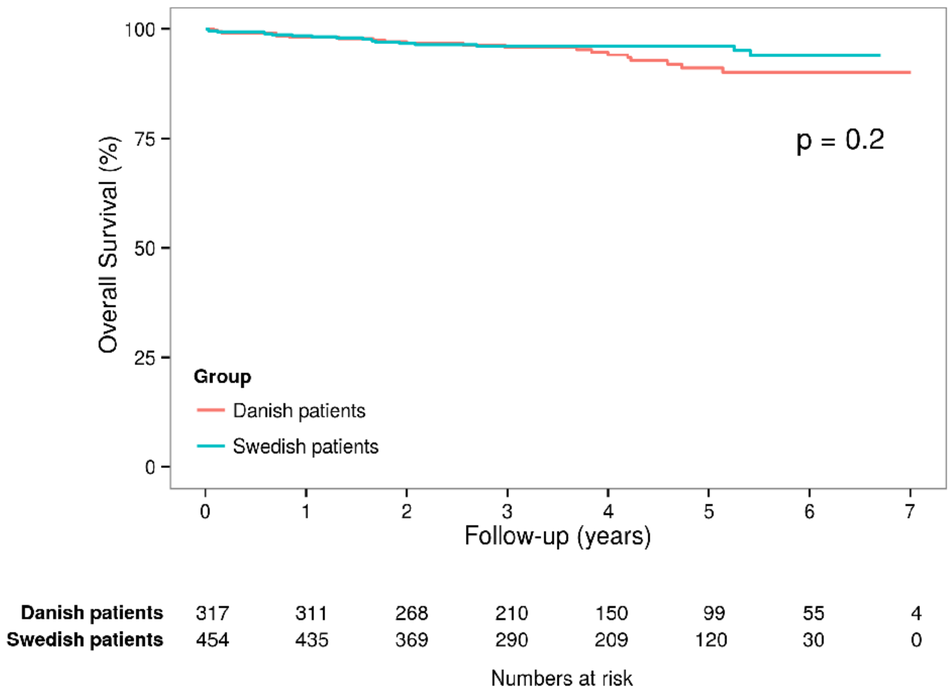
Patients with classical Hodgkin lymphoma (HL) in first remission are followed closely for signs of relapse, but the use of routine surveillance imaging for this purpose is controversial. The follow-up (FU) strategies in Denmark and Sweden are similar except for the routine imaging practice for patients in complete remission (CR). The aim of this study was to examine the impact of routine imaging on the post-remission survival in HL.

Patients and Methods

Patients registered in the Danish (LYFO) and Swedish population-based lymphoma registries were included by the following criteria: a) classical HL in 2007-2012, b) age 18-65 years at diagnosis, and c) CR after treatment with ABVD or BEACOPP +/- radiotherapy. The FU for Danish and Swedish patients included symptom assessment, clinical examinations, and blood tests with three- to four-month intervals in the first two years after treatment, and with longer intervals later in FU. In Sweden, imaging was only recommended for patients with clinically suspected relapse. In Denmark, routine imaging was included in the standard FU programs and half-yearly computed tomography (CT) for two years has been the most common practice. Overall survival (OS) was defined as the time from end of treatment until death/censoring. Cox regression models were used to assess prognostic factors for post-remission OS. Cumulative incidences for progression/relapse were calculated for Danish patients, as updated relapse data were available for this group.

Results

A total of 317 Danish and 454 Swedish patients were included. The male:female ratio and the frequencies of advanced stage disease (stage III-IV) and B-symptoms were comparable for Danish and Swedish patients (Table 1). However, the Swedish patients had slightly lower median age (34 vs. 38, P=0.02). Age ≥45 years (P<0.01) was the only adverse prognostic factor for post-remission OS in multivariate analysis, but ECOG performance score ≥2 and male sex were associated with trends for inferior OS (Table 2). An imaging-based FU strategy (Danish patients) had no positive or negative effects on post-remission survival for the entire cohort (Top-right Figure) or for patients grouped according to Ann Arbor stage (Right-middle Figure). The 2-year cumulative progression rates (death/relapse) were 4% (95%CI 1-7) for patients with stage I-II disease and 12% (95%CI 6-18) for patients with stage III-IV disease (Right-bottom Figure, only Danish patients included).



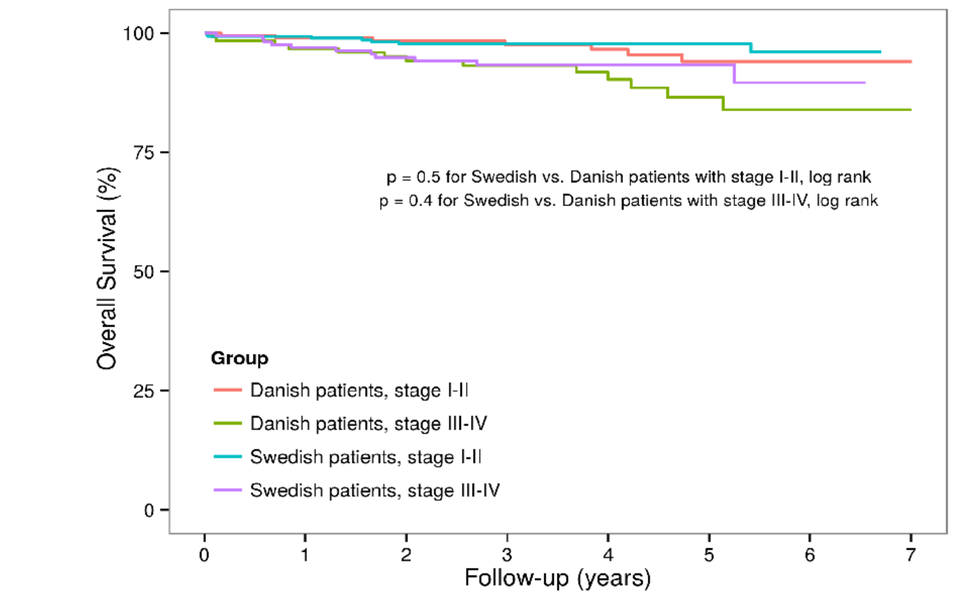


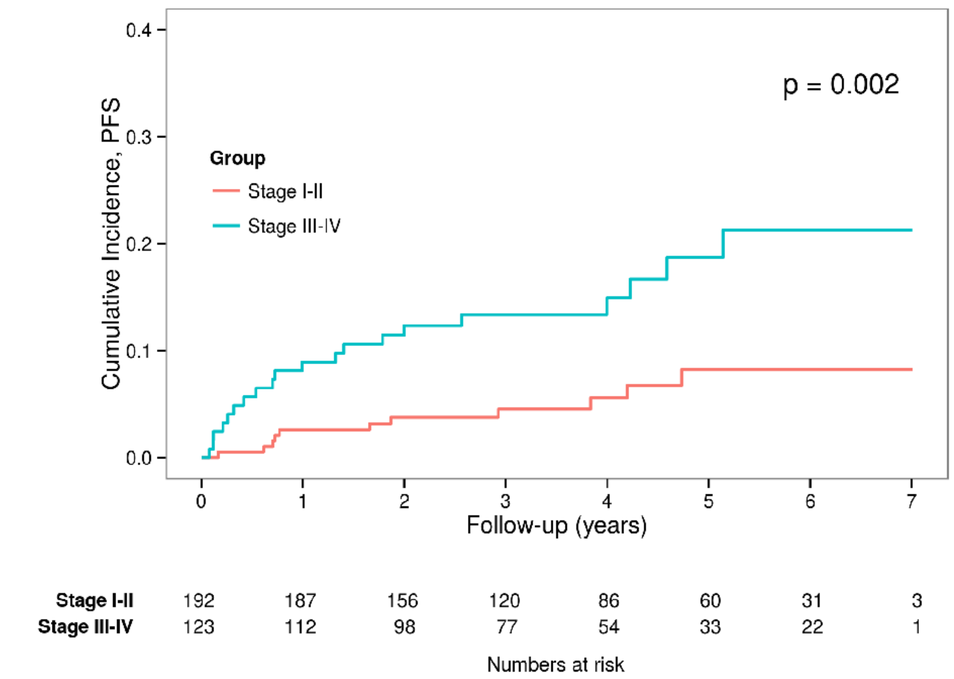
Table 1: Baseline characteristics

	Danish patients (n=317)	Swedish patients (n=454)	*P*
Median age (years)	39	34	0.02
Male:female ratio	1.2	1.2	0.9
Advanced stage (III-IV), n (%)	123 (39)	166 (37)	0.5
ECOG performance≥2, n (%)	6 (2)	24 (5)	0.02
B-symptoms at diagnosis, n (%)	142 (46)	197 (44)	0.2
1st line treatment chemotherapy			
• ABVD, n (%)	274 (86)	368 (81)	0.05
• BEACOPP, n (%)	43 (14)	86 (19)	
Radiotherapy, n (%)	168 (53)	162 (36)	<0.01

Table 2: OS determinants in 771 HL pts. in CR

	Univariate		Multivariate	
	HR	*P*	HR	*P*
Age ≥45 years	6.23	<0.01	5.34	<0.01
Male sex	2.49	0.01	1.90	0.08
Advanced stage (III-IV)	2.97	<0.01	1.73	0.2
ECOG performance status ≥ 2	3.71	0.01	2.65	0.06
B-symptoms at diagnosis	2.14	0.02	1.70	0.2
PET based CR	0.99	1.0		
Imaging-based follow-up (Denmark)	1.50	0.2	1.29	0.4

Uni- and multivairate Cox analyses. Variables significant in univaratie level were included in multivariate analysis including country of follow-up. HR=Hazard ratio.



Conclusions

Disease progression is rare among young HL patients in 1st CR, and few patients will benefit from a relapse oriented FU program. More importantly, there were no differences in the post-therapy survival for Danish and Swedish patients despite the widespread use of routine imaging in Denmark, suggesting that imaging-based FU for HL in 1st CR is of no benefit.

Correspondance: Tarec Christoffer El-Galaly
Aalborg University Hospital
Mølleparkvej 4
DK-9100, Aalborg
Phone: 0045 26798867
Email: tarec.galaly@gmail.com

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