

ABSTRACT (ASCO 2017)

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Infection Related Late Mortality in Survivors of Childhood Cancer with Asplenia or Radiation-Induced Hyposplenism: A Report from the Childhood Cancer Survivor Study

Background

Asplenia or hyposplenism can develop in survivors of childhood cancer following splenectomy or radiotherapy exposure to the left upper quadrant of the abdomen (LUQ). Knowledge regarding long-term infection related outcomes for these survivors is limited.

Methods

Infection related late mortality (sepsis, meningitis or pneumonia) was evaluated in 20,805 5-year survivors (diagnosed <21 years of age from 1970-1999, median follow-up 26 years, range 5-44) using cumulative incidence and Poisson regression models to calculate adjusted relative risk (RR) and 95% confidence intervals (CI). Average LUQ radiation was calculated as a surrogate for splenic radiation.

Results

Treatment included splenectomy for 1328 survivors (6%). An additional 10,295 (49%) were exposed to LUQ radiotherapy without splenectomy. The cumulative incidence of infection related late mortality was 1.4% (95%CI: 0.7%-2.2%) at 35 years after splenectomy and 0.6% (95%CI: 0.4%-0.8%) after LUQ radiotherapy, with a total of 78 deaths attributable to infectious causes (25 sepsis, 1 meningitis, 52 pneumonia). Splenectomy (RR=8.4, $p<0.001$) and increasing LUQ radiotherapy dose ($p<0.001$) were independently associated with infection related late mortality (Table).

Multivariate analysis of factors associated with infection related late mortality*

Treatment	RR (95% CI)	P
No splenectomy; no RT (Ref.)	1.0	
Splenectomy	8.4 (3.5 - 20.1)	<0.001
No splenectomy, 0.1-10 Gy LUQ RT	2.4 (1.1 - 5.2)	0.028
No splenectomy, 10-19 Gy LUQ RT	6.1 (2.5 - 14.9)	<0.001
No splenectomy, 20+ Gy LUQ RT	9.3 (3.2 - 27.0)	<0.001

*Adjusted for age at diagnosis, attained age, sex, race and chronic health conditions.
RT, radiotherapy

Conclusions

Splenectomy and LUQ radiotherapy increased risk for infection related late mortality. While infectious mortality increased with increasing LUQ radiation dose, even lower dose exposure (<10Gy) increased risk substantially. Accordingly, cancer survivors exposed to LUQ radiotherapy should be considered at risk for functional asplenia and managed similarly to asplenic individuals with respect to vaccinations and febrile illnesses.

Characters: 1973

Tables: 1