Age-specific mortality among TB patients in Denmark 1998-2010

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RATIONALE:

- Denmark is a Tuberculosis (TB) low-incidense country with an incidence of 6.5/100.000 per year. TB is not uncommon, though, among socially marginalized groups, and among immigrants from high-incidence countries.
- We have previously shown that TB in Denmark is connected to a social deroute, with increasingly lower income relative to matched controls, and dependency on public transfer income.
- Previously, we demonstrated an inferior cumulative survival among TB-patients. With this study, we aimed to elucidate if the inferior survival is more evident in certain age groups.

OBJECTIVE:

- To evaluate the mortality among TB patients in the years after diagnosis and treatment, in a national TB cohort
- To estimate relative age-specific survival compared with matched controls, in a retrospective case-control study

METHODS:

- Using Danish National Patient Registry, we retrospectively identified TB-patients between 1998-2010.
- Cases were matched to controls by age, gender, civil status and geography.
- Mortality data were obtained from Danish Civil Registration System.
- We calculated age-specific hazard ratio and cumulative survival function, adjusting for varying follow-up, distributed among age groups, based on the age at TB-diagnosis

RESULTS:

- 6,713 cases and 28,217 controls were followed for max. 12 (span: 0-12) years.
- Survival was inferior among cases relative to controls in all age groups, and significantly so for age groups above 20 years of age (Figure 1), peaking at a Hazard Ratio of 8.7 (95% CI: 5.53;16.69) in the 30-39 years age (Table 1)
- Absolute difference in mortality between cases and controls, though, increased with older age.
- Both male and female cases had lower cumulative survival than matched controls (Table 1)

Figure 1. Cumulative survival function for cases and controls in 10-year age gruops. Cases and controls under 30 years of age of diagnosis are not shown, due to low absolute mortality.

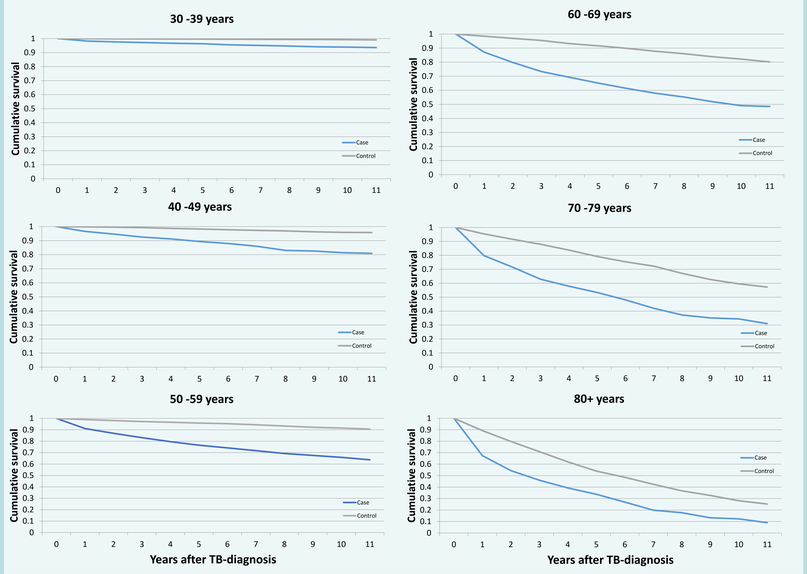

Table 1. Share of cases and controls in age- and gender groups, and the share herof who died during follow-up, and age- and gender related hazard ratio of mortality.

	Case		Control				
Subjects	**All** N	**Share dead** %	**All** N	**Share dead** %	**Hazard Ratio (95% CI)**		**P-value**
Age group							
0-9 years	374	0.5	1609	0.2	2.84	(0.47;17.03)	0.2543
10-19 years	459	0.7	2116	0.2	4.09	(0.83;20.30)	0.0844
20-29 years	786	1.7	3474	0.3	**7.51**	(2.98;18.88)	**<0.001**
30-39 years	1137	5.1	4883	0.6	**8.70**	(5.53;13.69)	**<0.001**
40-49 years	1139	14.0	4747	2.8	**5.85**	(4.60;7.44)	**<0.001**
50-59 years	944	27.6	3813	6.1	**5.68**	(4.71;6.85)	**<0.001**
60-69 years	737	40.8	3010	12.5	**4.34**	(3.68;5.11)	**<0.001**
70-79 years	723	56.0	2911	30.0	**2.61**	(2.29;2.96)	**<0.001**
80+ years	414	74.6	1654	55.6	**2.00**	(1.73;2.31)	**<0.001**
Gender							
Male	3750	24.8	15681	9.7	**3.58**	(7.27;3.92)	**<0.001**
Female	2963	19.6	12536	8.4	**3.01**	(2.69;3.36)	**<0.001**
All (N)	6713		28217				

CONCLUSION:

- Cumulative survival of adult TB patients is significantly inferior to matched controls. While the difference in survival is substantial among elderly patients, a high relative risk of dying is particularly of concern among young and middle-aged adult TB patients.
- While mortality among elderly patients may be due to co-morbid diseases which themselves increased the risk of TB, mortality among younger adults is likely due to low socio-economic standing and poor general health.
- The findings are specific to Denmark; nevertheless, our study emphasizes that clinicians attending TB patients in all low-incidence countries should be aware that TB is marker of living conditions associated with a strikingly high mortality among young- and middle aged adults.

Ethihcal statement:
The study was approved by the Danish Data Handling Agency. The study was supported by a grant from the Respironics Foundation. None of the authors have any conflicts of interest to disclose.

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