

Pelvic fractures in institutionalized elderly people: Excess mortality and potential implications

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Background

Pelvic fractures

- Heterogeneous group of fractures
 - High energy traumas (traffic accidents)
 - Young men
 - Low energy traumas (falls)
 - Old women
 - Increasing number during the last decades

J. Parkkari et al.: Osteoporotic Pelvic Fractures in Finland 1970–1991

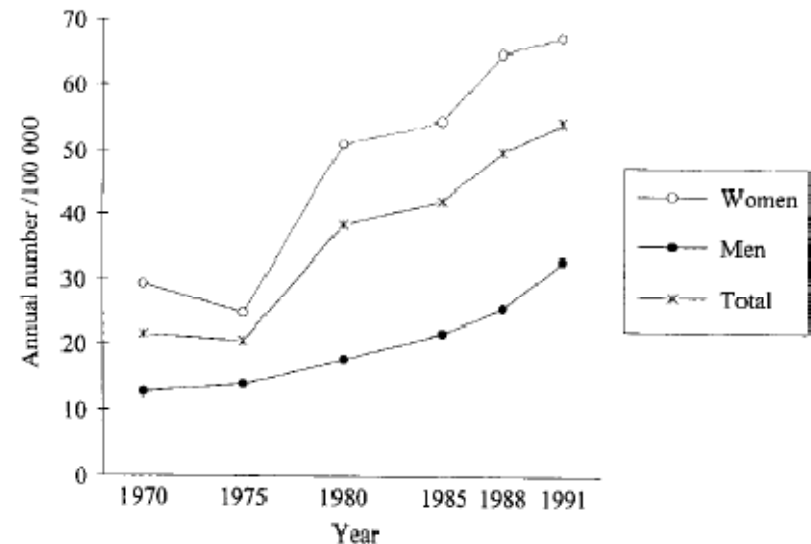
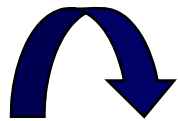


Fig. 1. Changes in the age-adjusted incidence of osteoporotic pelvic fractures in men and women 60 years or older in Finland over the period 1970–1991.

Low energy pelvic fractures

- Treatment: conservative
- Prognosis: supposed to be good
- However, some studies report considerable one-year mortality after pelvic fracture
 - High baseline mortality in this age-group



Appropriate comparison group is needed to calculate excess mortality

Methods (I)

- Dataset
 - 134,353 residents institutionalized in Bavarian nursing homes between 2001 and 2006 and insured at the Allgemeine Ortskrankenkasse (AOK)
- Health insurance (AOK)
 - Germany's largest statutory health insurance company
 - Covers about 50% of all residents living in nursing homes in Bavaria
- Data source
 - Routine data of the health insurance
 - Hospital discharge diagnoses were used to identify pelvic fractures (ICD-10: S32 except lumbar spine)

Methods (II)

- Pelvic fractures
 - 1,048 pelvic fractures in women; 106 in men
- Comparison non fracture group
 - To each patient with a pelvic fracture 5 residents without pelvic fracture (n=5,770) were matched ...
 - ... by sex, age, date of admission to the nursing home, *level of care*
 - *Level of care*: Measure for the need of care and the degree of functional impairment; categorised into 3 levels (I, II, III) by a physician

Methods (III)

- Mortality rate = number of death / sum of person-months
- Absolute mortality rates and relative risks (hazard ratio) were calculated
 - Separately for 6 time intervals (0 to 1 month, >1 to 2 months, >2 to 3 months, >3 to 6 months, >6 months to 1 year, >1 year)
- Comparison with femoral fractures
 - Mortality rates of femoral fractures (N=9,402) for the same time intervals

Results

Characteristics in the group with fractures of the pelvis and the comparison group*

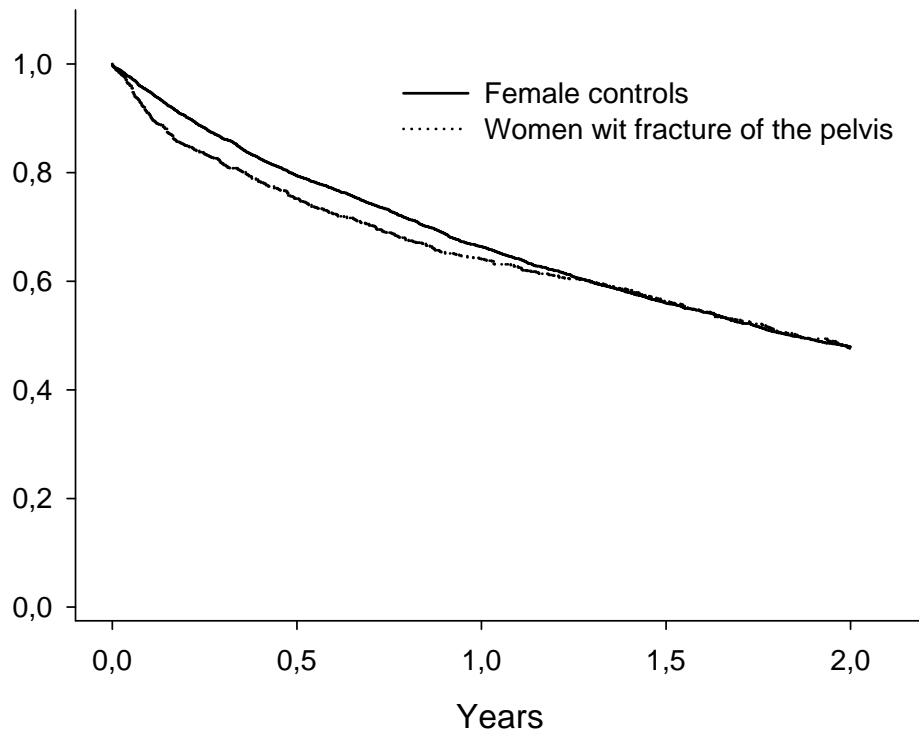
	Women (n=6288)	Men (n=636)
	N (%)	
Age at fracture or at start of follow-up N (%)		
Median (range) (years)	88.0 (65.5-106.4)	86.6 (67.2-99.0)
Level of care N (%)		
1	3792 (60.3)	372 (58.5)
2	2262 (36.0)	258 (40.6)
3	234 (3.7)	6 (0.9)
Pelvis fractures/1000 py		
All residents	5.56	2.74
Only newly admitted residents	7.51	3.62

* matched for sex, age, *level of care* and date of admission to the nursing home

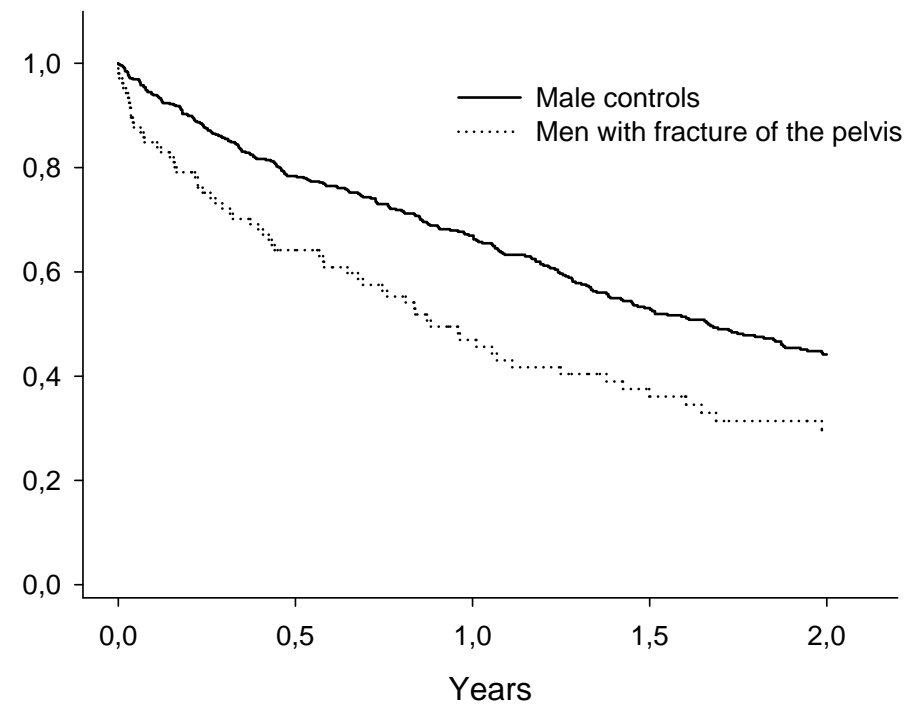
Excess mortality after pelvic fracture

Survival curves (N = 1,154 pelvic fractures)

Women



Men



Mortality rates and risk of mortality in the group with pelvic fractures and in the comparison group (Women)

Women			
Mortality / 100 person-months			
	Fracture cases	Comparison group	HR (95% CI) †
0 to 1 month	7.9	4.3	1.83 (1.42-2.37)
>1 to 2 months	6.3	4.1	1.52 (1.13-2.04)
>2 to 3 months	3.5	3.9	0.91 (0.62-1.34)
>3 to 6 months	3.5	3.5	1.01 (0.79-1.28)
>6 months to 1 year	2.7	3.0	0.90 (0.73-1.12)
>1 year	2.6	2.5	1.03 (0.90-1.18)

† hazard rate ratio (95% confidence interval)

Mortality rates and risk of mortality in the group with pelvic fractures and in the comparison group (Men)

	Men		
	Mortality / 100 person-months		
	Fracture cases	Comparison group	HR (95% CI) †
0 to 1 month	15.5	5.2	2.95 (1.57-5.54)
>1 to 2 months	6.8	3.1	2.22 (0.86-5.71)
>2 to 3 months	6.1	4.8	1.29 (0.49-3.41)
>3 to 6 months	5.3	3.7	1.41 (0.73-2.73)
>6 months to 1 year	4.6	2.5	1.86 (1.03-3.38)
>1 year	3.9	3.4	1.13 (0.72-1.75)

† hazard rate ratio (95% confidence interval)

Place of death

- Deaths during the first 2 months after the injury
 - 26% as hospital inpatients
 - 74% after discharge back to the nursing home

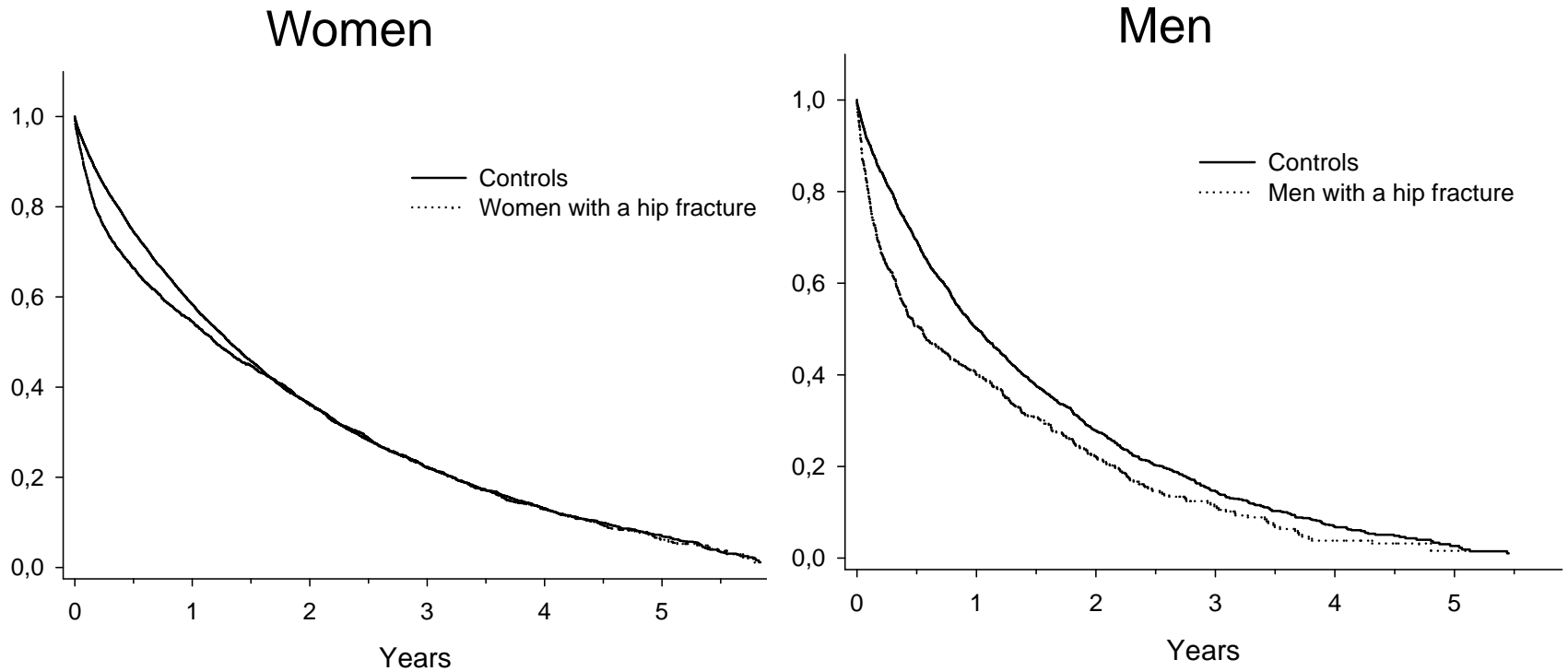
Rehabilitation

- Transferring to a rehabilitation clinic
 - In 3.5% after a pelvic fracture

Discussion

Excess mortality after hip fracture

Data from Baden-Württemberg (N = 4342 hip fractures)



Mortality during the first 2 months in femoral fractures, pelvic fractures and in the comparison non fracture group

	Mortality / 100 person-months		
	Femoral fracture cases	Pelvic fracture cases	Comparison group
	Women		
0 to 1 month	12.7	7.9	4.3
>1 to 2 months	6.8	6.3	4.1
	Men		
0 to 1 month	22.4	15.5	5.2
>1 to 2 months	10.1	6.8	3.1

Potential causes of excess mortality after pelvic fracture

- Pelvic fractures can be very painful particularly when mobilising or sitting
- Continuation of thromboprophylaxis is unusual
- Physiotherapy limited



Complications of immobilization like pulmonary embolism or infections (pneumonia or urinary sepsis) may have contributed

Potential consequences

- Continuation of low dose anticoagulation for 2 months following the fracture
- Intensive mobilisation program
- Optimization of analgesic therapy

Strengths

- First study evaluating excess mortality after pelvic fracture
 - Which used a comparison group
 - Analysed residents of nursing homes
- Matching procedure included a measure for functional status

▪ Limitations

Only fractures which led to a hospital admission were included

No information about the cause of death

Residential Care Summit



Victoria, November 2009