

# Spinal Infection in the Elderly Aged over 80 Years

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# Recent Trends in Spinal Infection

- Spinal infection has recently been rising.
- The ages of patients gradually advanced.
- The percentage of immunocompromised hosts dramatically increased.

Nagashima H, et al. *Int Orthop* 2010

- There have been some reports on the characteristics of spinal infection in the elderly.

The definitions of the term “elderly”

over 60 years Cahill DW, et al. *J Neurosurg* 1991

over 65 years Hempelmann RG et al. *Eur Spine J* Epub

Velan GJ et al. *Spinal Cord* 1999

- There has been no report focusing on spinal infection in an advanced age group: over 80 years.

# Countries whose Life Expectancy exceeds 80 years

8 countries  
(2000)



74 countries !  
(2045-2050)

81 yrs. **Japan**  
San Marino  
80 yrs. Andorra  
Australia  
Iceland  
Monaco  
Sweden  
Switzerland

WHO  
World health statistics 2010

87 yrs. <b>Japan</b>	84 yrs. United Kingdom	80 yrs. Bahamas
86 yrs. Hong Kong	US Virgin Islands	Belize
Switzerland	83 yrs. Channel Islands	Oman
Australia	Cyprus	Poland
France	Republic of Korea	Argentina
Iceland	Slovenia	Bahrain
85 yrs. Macao	United States of America	Guam
Spain	Portugal	Réunion
Israel	Puerto Rico	Panama
Italy	Denmark	Vietnam
Canada	82 yrs. Chile	Mayotte
New Zealand	Costa Rica	Qatar
Norway	Cuba	Slovakia
Sweden	Kuwait	Aruba
Austria	United Arab Emirates	Bosnia & Herzegovina
Belgium	81 yrs. Czech Republic	French Polynesia
84 yrs. Luxembourg	New Caledonia	Grenada
Finland	Barbados	Libyan Arab Jamahiriya
Ireland	Albania	Malaysia
Germany	Croatia	Ecuador
Martinique	Uruguay	Estonia
Greece	Brunei Darussalam	Sri Lanka
Malta	French Guiana	Syrian Arab Republic
Netherlands	Mexico	
Guadeloupe	Netherlands Antilles	
Singapore		

UN: World Population Prospects

# Objectives

- To clarify whether the incidence of spinal infections in the elderly aged over 80 has been increasing
- To clarify whether factors such as gender, immunocompromised hosts, involved levels, mortality and pathogens differed between the elderly over 80 years old and patients aged 80 years or under

Future trends in elderly spinal infections in other countries may be predicted by studying the characteristics of spinal infections in Japan.

# Patients & Methods

**98** consecutive patients  
with spinal infection  
who were admitted to Tottori University Hospital  
between 1999 and 2008.

Exclusion: surgical site infection , iatrogenic infection

Study 1

**Group 1:** 1999-2003

**Group 2:** 2004-2008



● Prevalence of pts > 80 y.o.\*

Study 2

**Group A:** Pts. > 80 y.o

**Group B:** Pts. ≤ 80 y.o.

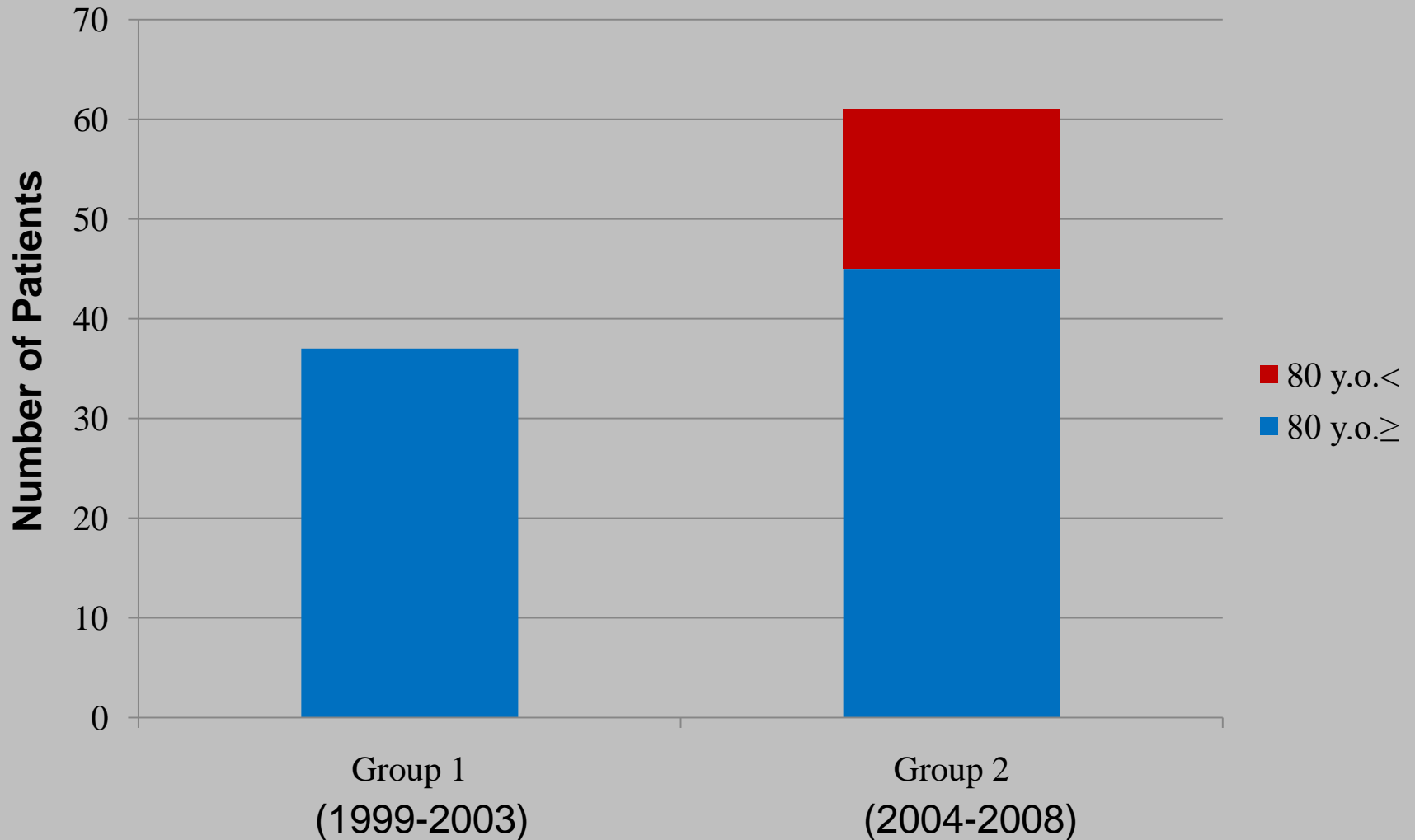


- Gender distribution\*
- Immunocompromised hosts\*
- Involved levels<sup>#</sup>
- Mortality\*
- Pathogens\*

Statistical Analysis: one-way ANOVA<sup>#</sup>, t-test\*

# Result Study 1

## Changes in the Elderly Aged over 80 Years with Spinal Infection



$p < 0.001$  (T test)

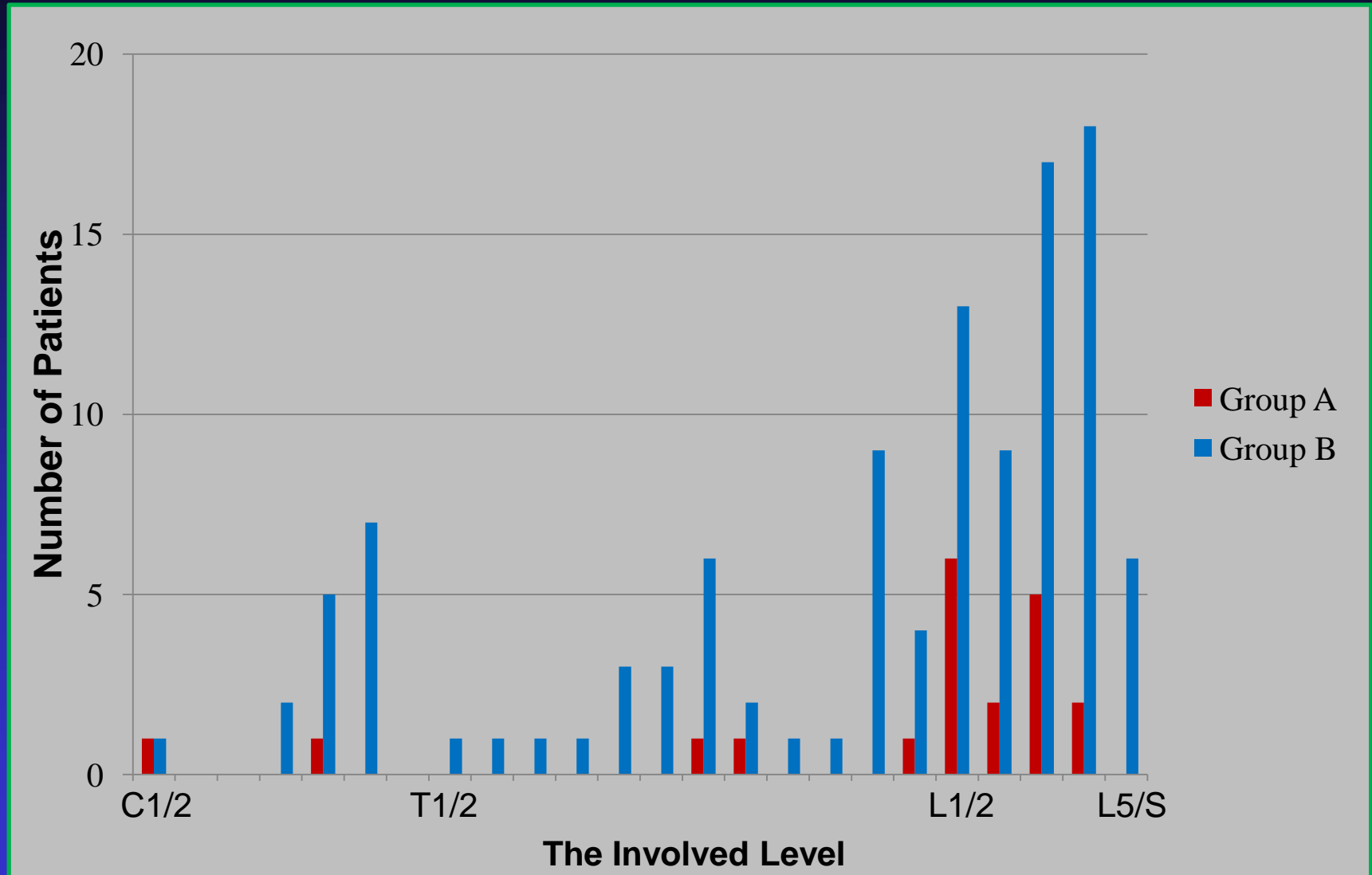
## Result Study 2

# Demographic Patient Data

Category	Group A	Group B	p-value
Number of patients	16	82	
Male:Female	9:7	57:25	0.306
Immunocompromised hosts	9 (56.3%)	44 (53.7%)	0.851
Mortality	2 (12.5%)	6 ( 7.3%)	0.494

## Result Study 2

# The Involved Level



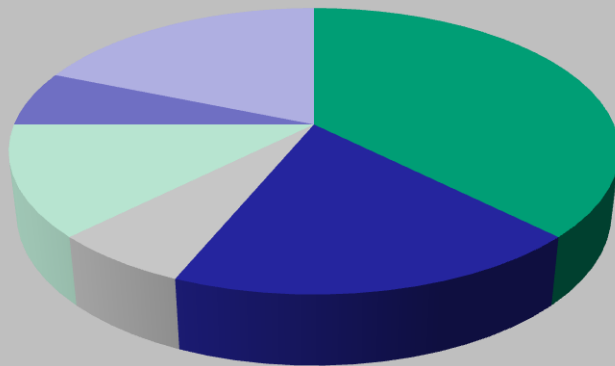
$p=0.533$  (one way-ANOVA)

Result  
Study 2

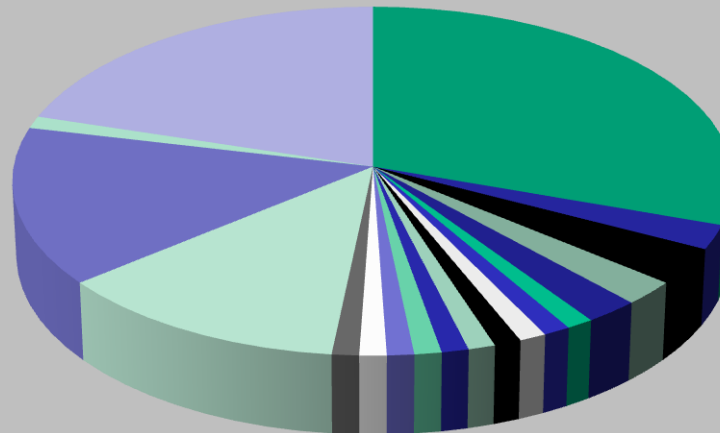
# The Pathogenic Organisms

Detection Rate: 78.6%

Group A  
(80 y.o. <)



Group B  
(80 y.o. ≥)

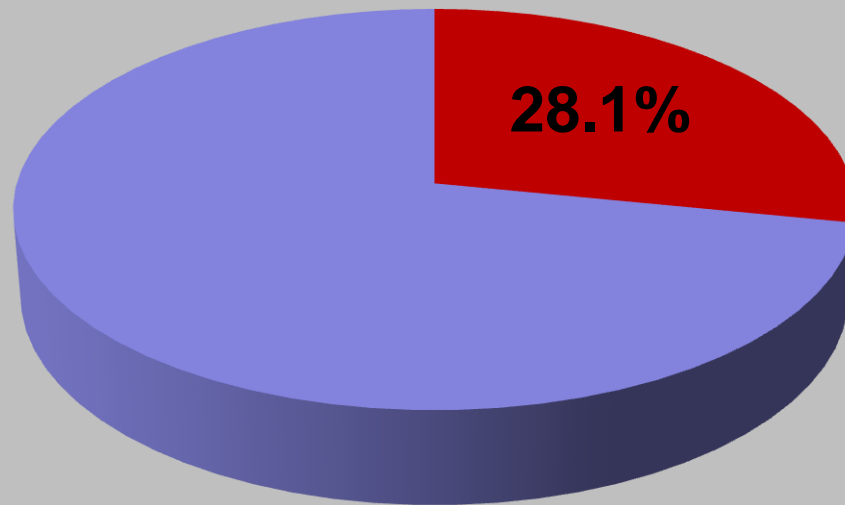


- *Staphylococcus aureus*
- *Staphylococcus epidermidis*
- *Staphylococcus schleifer*
- *Escherichia coli*
- *Pseudomonas aeruginosa*
- *Klebsiella pneumoniae*
- *Enterococcus faecalis*
- *Enterococcus species*
- *Enterobacter cloacae*
- *Streptococcus pneumoniae*
- *Streptococcus agalactiae*
- *Streptococcus species*
- *Streptococcus milleri Group*
- *Citobacter amalonaticus*
- *Viridans streptococcus*
- *Bacteroides species*
- *Mycobacterium tuberculosis*
- *Mycobacterium intercellulare*
- *Mycobacterium avium*
- Unknown

**Result  
Study 2**

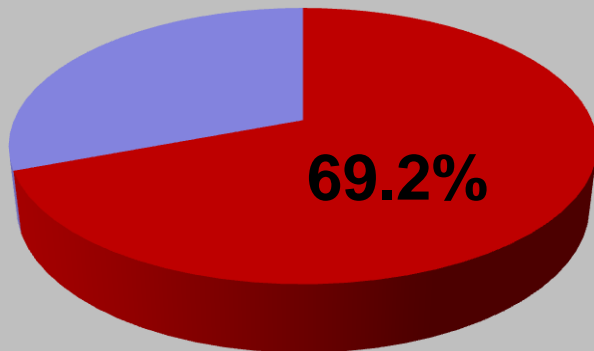
# Drug-resistant Pathogens

Group B  
(80 y.o.  $\geq$ )



■ drug-resistant pathogen (MRSA, MRSE)

Group A  
(80 y.o.  $<$ )



P=0.004 (T test)

# Review of Literature

- No report focusing on spinal infection or osteomyelitis at other sites in an advanced age group: over 80 years.
- We searched Medline for infection in the advanced age group, and found several papers describing the characteristics of **pneumonia** in this age group.

## Pneumonia in an Advanced Age Group

### Incidence

6.0 / 1000 people 15-59 years of age

34.2 / 1000 people  $\geq 75$  years of age

Jokinen C, et al. *Am J Epidemiol* 1993

1 / 20 elderly  $\geq 85$  years of age each year in the United States

Jackson ML, et al. *Clin Infect Dis* 2004

### Drug-resistant pathogen

Risk factor:  $\geq 65$  years of age

Ferrara AM. *Clin Interv Aging* 2007

Niederman MS, et al. *Am J Respir Crit Care Med* 2001

Clavo-Sánchez AJ, et al. *Clin Infect Dis* 1997

# Conclusion

- The incidence of spinal infections in the elderly aged over 80 has been increasing.
- Drug-resistant strains of bacteria were detected approximately 2.5 times more frequently in the elderly patients over 80 years, which makes infection management more difficult in this age group.