

# Analysis of risk factors for low back pain worsened in the region residents in Yonago, Japan

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# Background and Purpose

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## Risk factors for low back pain

- Lack of exercise
- Smoking

Hartvigsen et al. Spine 2007

On the other hand,  
No association between physical findings(eg; Height,Weight ,Body mass index)  
and low back pain

Power et al. Am J Public Health 2001

Actually... There are no researches with an enough evidence to clarify association between low back pain  
and life style or physical findings

Wai et al. Spine J 2008

## Purpose

To investigate analysis of risk factors for low back pain worsened in the region residents



Many elderly people work as farmers

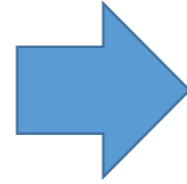


# Material and Methods

**96 residents**

Participated general medical examination from 2014 to 2016 in Tottori, Japan

Male 34      Female 62  
Mean age 73.9 years old  
(52~97)



	Group A	Group B	P Value
N	69	27	
Age	74.3 ± 7.1	73.4 ± 8.5	0.95 <sup>a</sup>
Gender (Male : Female)	26:43	8:19	0.46 <sup>b</sup>
VAS	20.0 ± 26.4	20.1 ± 18.6	0.17 <sup>a</sup>
Osteoporosis Therapy(%)	9/69 (13.0%)	2/27 (7.41%)	0.67 <sup>c</sup>

a. Mann-Whitney U test    b. Chi-square test    c. Fisher's exact test

Group A: no change in low back pain during study period

Group B: worsening low back pain during study period

## Methods

### 1) Questionnaire low back pain (LBP)

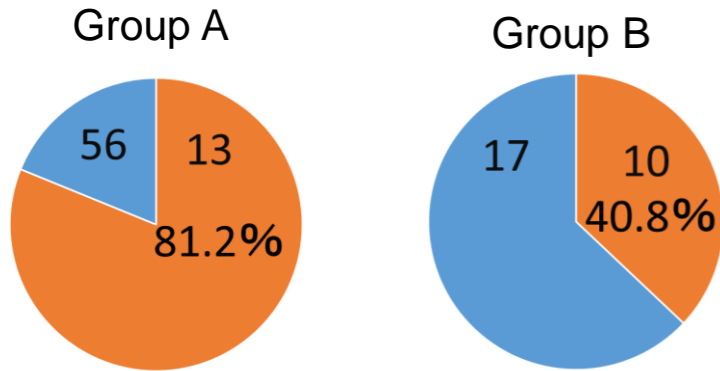
- ① The presence of LBP
- ② The habit of Muscle exercise  
( at least 2 times or more /week)
- ③ Visual analog scale (VAS)

### 2) Physical examination

- ① Standing alignment (Normal or abnormal by photograph)
- ② Sketalal Muscle Index (SMI)  
= muscle volume /Height(Kg/m<sup>2</sup>)
- ③ Bone mineral density(BMD: %YAM)
- ④ Body mass index(BMI)

# Results

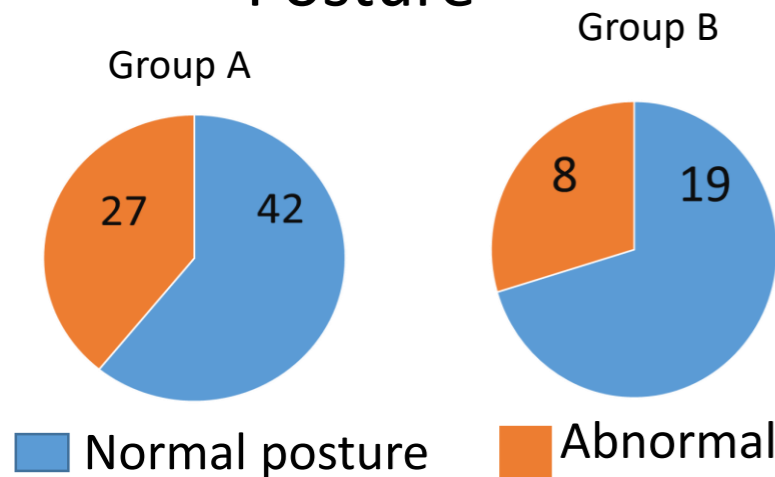
## Regular exercise



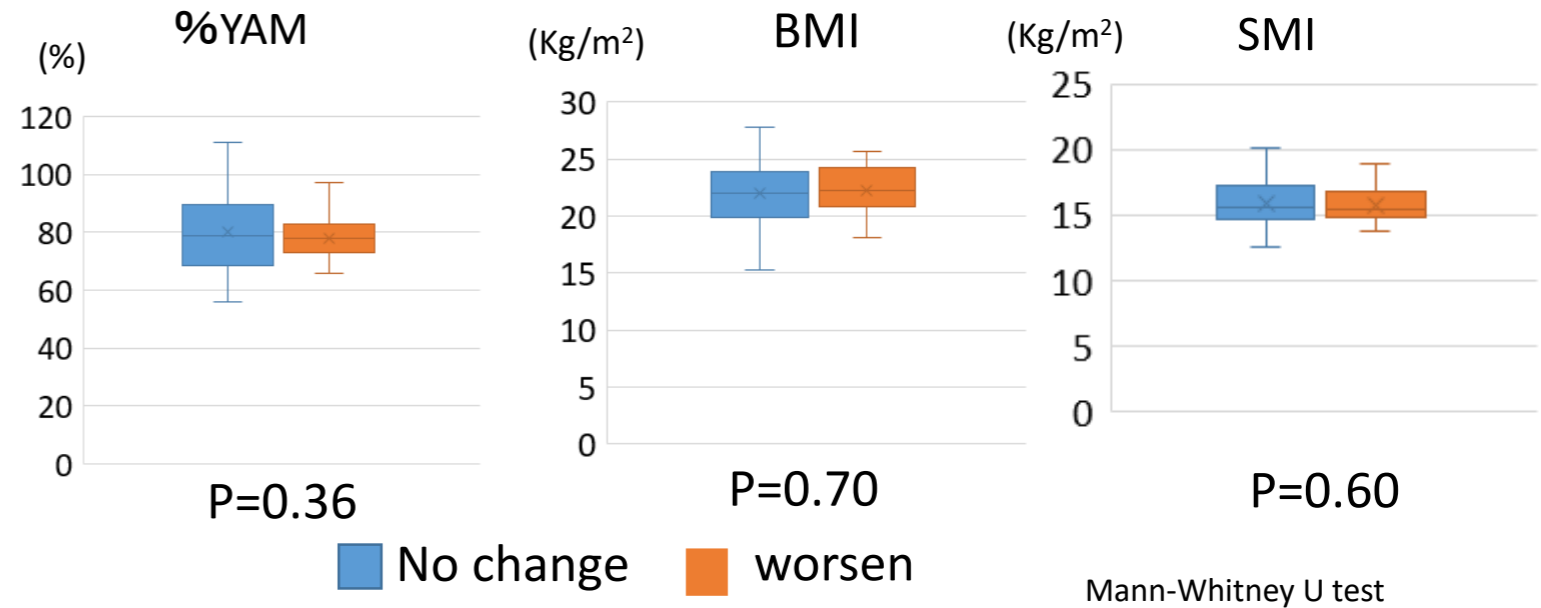
The prevalence of Regular exercise was higher in Group A than Group B (Chi-square test :  $P < 0.001$ )

■ Regular exercise(+) ■ Regular exercise(-)

## Posture



No differences in posture (Chi-square test :  $P = 0.34$ )



## Logistic regression: Analysis of Risk Factor LBP worsened

	Odd ratio	95% confident interval	P- value
SMI	0.99	0.26-3.8	0.93
Gender	1.51	0.54-4.23	0.42
Age	0.99	0.93-1.06	0.81
BMD (%YAM)	0.97	0.93-1.02	0.21
Posture	0.89	0.62-1.27	0.15
Excise	<b>0.19</b>	<b>0.07-0.53</b>	<b>0.002</b>

Regular exercise prevented LBP

# Sub analysis : Regular exercise effect LBP?

We prepared two group to investigate the effect of regular exercise for LBP

Group C: LBP worsened despite of regular exercise

Group D: LBP improved with no regular

## Demographics

	Group C	Group D	P Value
N	13	18	
Age	74.3 ± 7.0	74.1 ± 7.5	0.96 <sup>a</sup>
Gender	Male 4 Female 9	Male 7 Female 11	0.15 <sup>b</sup>
VAS	23.3 ± 23.0	29.8 ± 33.8	0.68 <sup>a</sup>

a.Man-Whitney U test b.Fisher's exact test

## Assessment

## Posture ▪ SMI ▪ BMI ▪ BMD

	Group C	Group D	P Value
Posture (abnormal)	4/13	10/14	0.50 <sup>a</sup>
SMI (Kg/m <sup>2</sup> )	15.5 ± 1.4	15.9 ± 1.8	0.96 <sup>b</sup>
BMI (Kg/m <sup>2</sup> )	22.6 ± 2.1	21.9 ± 2.9	0.47 <sup>b</sup>
<b>BMD (YAM%)</b>	<b>75.4 ± 6.5</b>	<b>83.3 ± 12.0</b>	<b>0.04<sup>b</sup></b>

The residents with low bone density did not get benefit from exercise effects.

# Discussion

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Regular exercise effect LBP even though non-specific exercise for LBP

Carr et al. Disabil Rehabil 2005  
Mannion et al. Rheumatology 2001  
Moffett et al. BMJ 1999

## Present Study

- ◆ Non specific regular exercise for LBP prevented worsening low back pain.
- ◆ The patients with osteoporosis deteriorate LBP in spite of regular exercise.

We considered the reasons which osteoporosis prevented the improvement LBP

The high prevalence of female (65% Female)  
Low prevalence of osteoporosis therapy (10%)

# Conclusion

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- 1) Regular exercise is useful in preventing low back pain.
- 2) People with low bone density did not get enough benefit with regular exercise to prevent LBP
- 3) Exercise is typically suggested to prevent low back pain in patients, it may not be effective in preventing low back pain associated with osteoporosis.

## **Disclosure of Conflict of Interest**

***Name of first author: Shinji Tanishima***

I have no COI  
with regard to our presentation.