Health-related Quality of Life (SRS-22r) of Adolescents with Idiopathic Scoliosis in Korea

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Introduction

Scoliosis

A complex spine deformity involving three-dimensional deviation of the spinal axis by deformation with thoracic lordosis, lateral curvature, and vertebral rotation.

(Trobish et al., 2010)

Diagnosis

By exceeding 10° of spinal curvature on an anterior-posterior X-ray image.

(Trobish et al., 2010)

Introduction
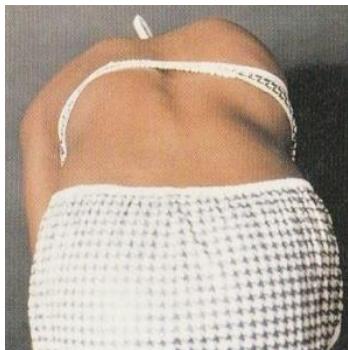
Adolescent idiopathic scoliosis (AIS)

- One of the most common musculoskeletal problems in adolescents, and the prevalence rate of AIS is more than 80% of scoliosis cases.

- Causes are unknown.

- Age of onset 10 years of age to skeletal maturity.

- Predominant in females, about 3~5times.

(Wick et al., 2009)

Introduction

Prevalence of AIS in Korea

0.35% (1998)

1.35% (2002)

Rapidly Increasing

6.17% (2008)

(Suh et al., 20011)

**Prevalence of AIS in U.S.A**

2~4% (2009)

(National Scoliosis Foundation and Depuy Spine, 2009)

Prevalence of AIS in Japan

0.87% (2011)

(Ueno et al., 2011)
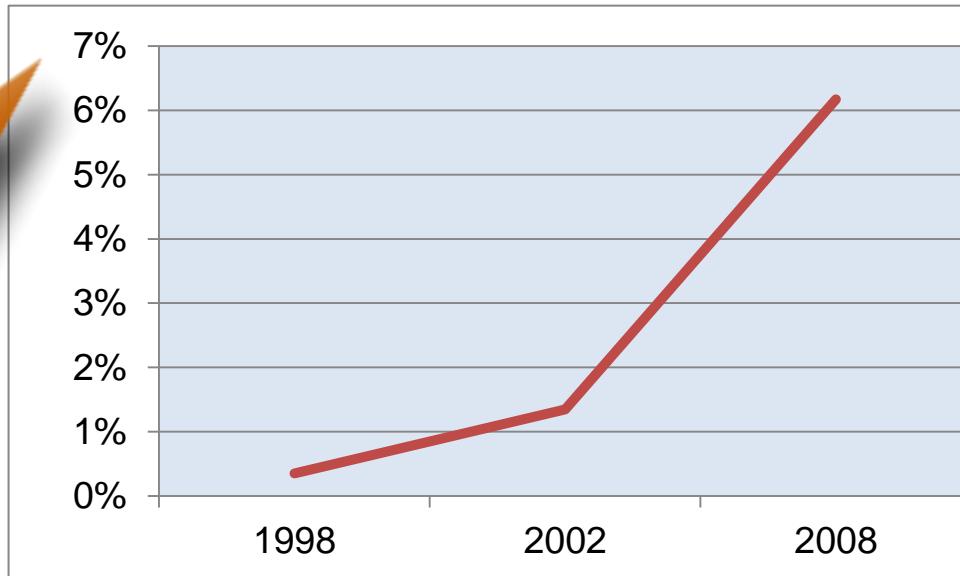
Increasing Pattern of AIS Prevalence Rate in Korea

1st Question: What are the specific characters of AIS prevalence among Korean adolescents?

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Introduction

Medical Treatments for AIS by Disease Severity

Cobb's angle	Diagnosis	Treatment
10°~25°	Mild Scoliosis	Observation
25°~45°	Moderate Scoliosis	Exercise Good Posture Electronic stimulation Brace
>45°	Severe Scoliosis	Operation
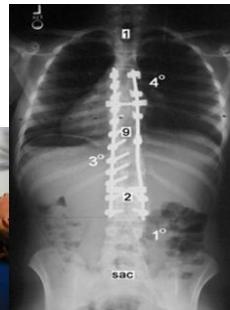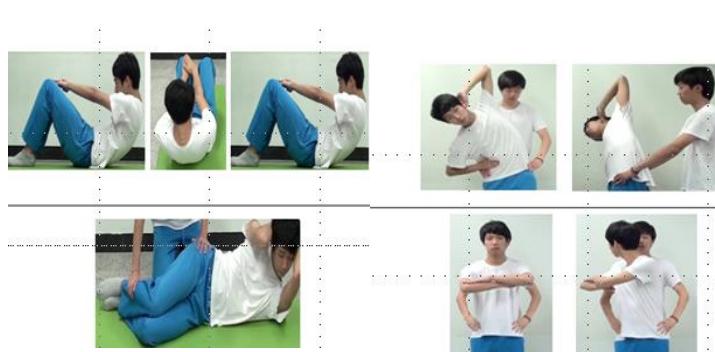
Introduction

Effects of AIS to Adolescents

Physical
- Limited physical activity cause of asymmetry of shoulder height, scapular, flank shape, hip height, & etc.
- Decreased body function, Muscular-skeletal pain

(Burns et al., 2009; Lee, 2008)

Psychological
- Decreased body-image
- Self-abasement, Depression
- **Decreased QoL**

(Choi et al., 2011; Sapountzi et al., 2001)

Social
- Impairment of interpersonal relationship, especially with peer
- Maladjustment at school

(Kim, 2010; Park, 2009)

Introduction

HRQoL

Assessments of health related quality of life have focused more on physicians and researchers because this allows assessment of a patient's perception of adolescents with idiopathic scoliosis condition and medical treatment effects (Asher et al., 2006).


Scoliosis Patient Questionnaire :Version 30

SRS 24 Patient Questionnaire(Haher et al., 1999)

SRS 22 Patient Questionnaire (Asher et al., 2000)

SRS 22-revision Patient Questionnaire(Asher et al., 2006)

Introduction

Function/Activity
Pain
HRQoL SRS-22r
Mental Health
Satisfaction with management
Image/Appearance
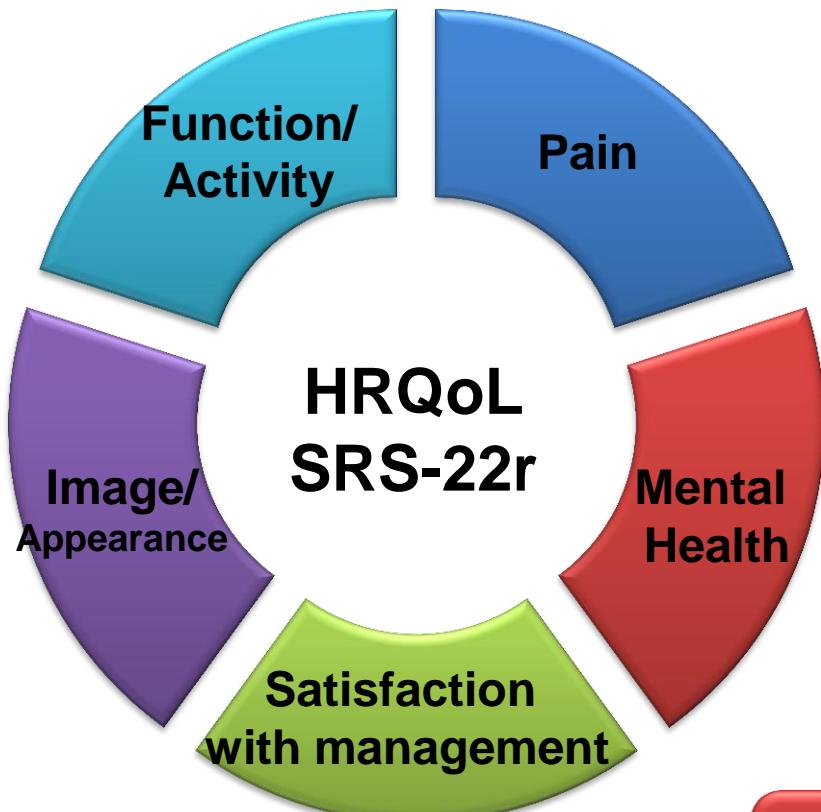
A better understanding of the HRQoL of idiopathic scoliosis adolescents is needed to identify patient perceptions of their condition and treatment effects by severity of disease, which will contribute to improved care.

2nd Question:
How is different the HRQoL by severity of IS?

Purpose

1 To characterize disease severity in adolescents with idiopathic scoliosis (AIS) in Korea.

2 To characterize health related quality of life (HRQoL) by disease severity in adolescents with idiopathic scoliosis (AIS) in Korea.

Methods

- **Descriptive study design**

- Study participants: **110 adolescents with idiopathic scoliosis**

- Study location: an outpatient orthopedic clinic and a rehabilitation clinic in two (K, S) tertiary hospitals located in Seoul, Korea

- Data collection: From November 2010 to August 2012

- To recruit study participants, research assistants explained the purpose and intention of this study and asked for agreement to participate from adolescents and their legal guardians

(IRB #: K hospital 3-2010-0172, S hospital 4-2011-0682

Study Participants

- **Inclusion criteria:**

  ➢ primary diagnosis of AIS determined by expert clinicians

  ➢ Cobb's angle over 10°

  ➢ age of 10-19 years old

  ➢ participants and their legal guardians agreed to participate

- **Exclusion criteria:**

  ➢ any diagnosable musculoskeletal disease except scoliosis

  ➢ cognitive impairment causing inability to read and understand the questionnaires

Materials

- **Cobb's angle & Type of treatment**

  ➢ Collected from the medical records with the permission

- **HRQoL**

  ➢ Used SRS-22r

  ➢ Consists of 22 questions

    ➢ function/activity (5 items), pain (5 items), self-image/appearance (5 items), mental health (5 items), and satisfaction with management (2 items)

    ➢ Each item allowed 5 response levels from worst to best (scored 1-5)

    ➢ Higher mean score indicates higher quality of life

    ➢ Cronbach's α of the measurement was 0.84 in this study

Data Analysis

- To assess differences in HRQoL (SRS-22r) according to severity of AIS, data were analyzed using PASW Window version 20.0

  - ➢ Descriptive statistics

  - ➢ Kruskal-Wallis tests

  - ➢ Mann-Whitney U tests

  - ➢ ANOVA P values < .05 were considered statistically significant

Results (1)

47.3%   41.8%   10.9%
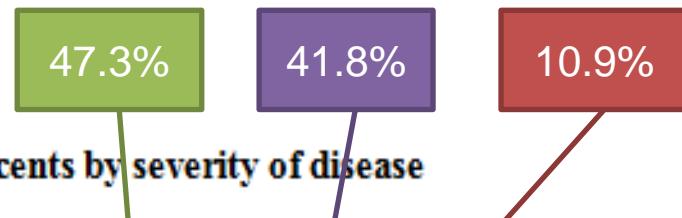
Table 1 General characteristics of idiopathic scoliosis adolescents by severity of disease

Characteristics	Categories	Total (N=110) n (%)	Mild (n = 52) n (%)	Moderate (n = 46) n (%)	Severe (n = 12)	p
Gender	Male	21 (19.1)	13 (25.0)	6 (13.0)	2 (16.7)	0.315
	Female	89 (80.9)	39 (75.0)	40 (87.0)	10 (83.3)	
Age at diagnosis (years)	10-12 (Late school age)	53 (48.2)	31 (59.6)	18 (39.1)	4 (33.3)	0.118
	13-15 (Junior high school age)	49 (44.5)	18 (34.6)	23 (50.0)	8 (66.7)	
	16-19 (High school age)	8 (7.3)	3 (5.8)	5 (10.9)	None	
Type of treatment	Observation	68 (61.8)	41(78.8)	27 (58.8)	None	<0.001
	Brace	3 (2.7)	None	2 (4.3)	1 (8.3)	
	Physiotherapy	23 (20.9)	8 (15.4)	11 (23.9)	4 (33.3)	
	Brace & Physiotherapy	16 (14.5)	3 (5.8)	6 (13.0)	7 (58.4)	

The mean age of participants was 14.2 years (SD 2.17)

The mean age of AIS diagnosis was 12.5 years (SD 1.82)

Results (2)

Table 2 HRQoL (SRS-22r) of idiopathic scoliosis adolescents by general characteristics

Characteristics	Categories	HRQoL (SRS-22r) (N = 110)	
		Mean (SD)	*P* Post-hoc
Gender	Male	4.18 (0.46)	0.061
	Female	4.21 (0.35)	
Age at diagnosis (years)	10-12 (Late school age)[a]	4.30 (0.29)	0.033 (a>b)
	13-15 (Junior high school age)[b]	4.12 (0.43)	
	16-19 (High school age)	4.15 (0.37)	
Type of treatment	Observation	4.28 (0.31)	0.025
	Brace	4.39 (0.33)	
	Physiotherapy	4.03 (0.48)	
	Brace & Physiotherapy	4.12 (0.35)	

Post-hoc: Scheffe

Results (3)

Table 3 HRQoL (SRS-22r) of idiopathic scoliosis adolescents by severity of disease

| Variable	Total (N=110)	Mild (n = 52)	Moderate (n = 46)	Severe (n = 12)	p
	Mean (SD)	Median (IQR*)			
HRQoL (SRS-22r)	4.21 (0.37)	4.30 (1.36)	4.20 (1.45)	4.07 (2.05)	0.137
Function/activity	4.70 (0.40)	5.00 (1.40)	4.80 (1.60)	4.50 (1.80)	0.053
Pain	4.49 (0.54)	4.60 (1.80)	4.60 (2.00)	5.00 (2.20)	0.692
Self-image/appearance	3.69 (0.67)	3.80 (2.20)	3.80 (3.00)	3.00 (2.80)	0.031
Mental health	4.05 (0.57)	4.20 (2.40)	4.00 (2.00)	4.10 (2.80)	0.414
Satisfaction with management	3.95 (0.66)	4.00 (2.00)	4.00 (2.00)	4.00 (2.00)	0.782

*IQR: Inter-quartile range

Discussion (1)

- **The age of AIS diagnosis is high during late school age (10-12 year-old, 48.2%) and junior high school age (13-15 year-old,44.5%).**

- However, in Korea, school screening regulations do not include scoliosis detection.

- Results suspicious for IS are o... chest x-ray results of pulmo... examinations.

- A chest x-ray for tuberculosis scre... ...ended at ages 13 and 16 years for all adolescents in Korea. Therefore, many adolescents are initially diagnosed with AIS around 13 years old.
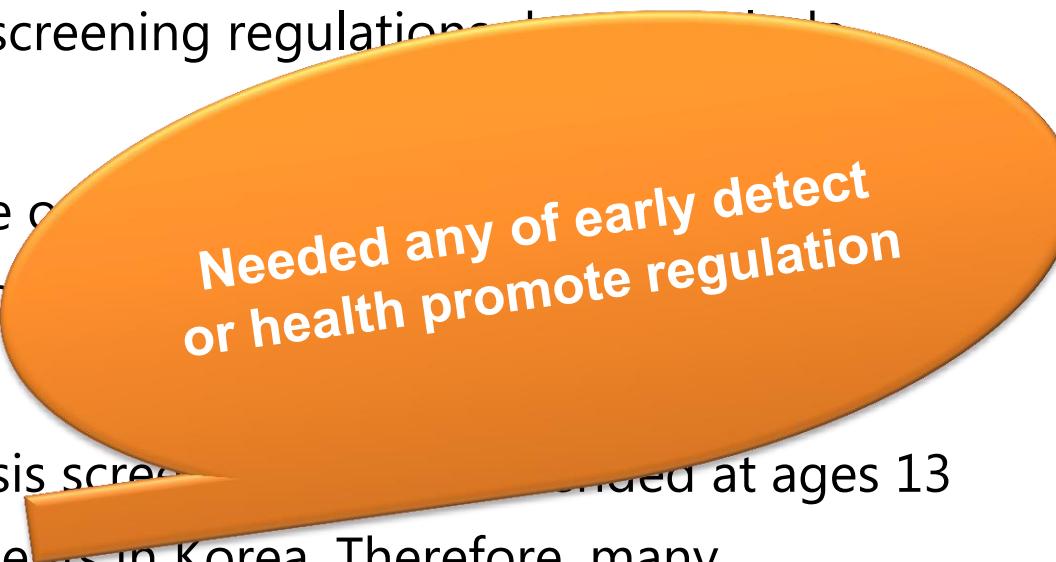
Needed any of early detect or health promote regulation

Discussion (1) – Cont.

- In general, the American Academy of Pediatrics has recommended scoliosis screening at ages 10, 12, 14, and 16 years, and the Scoliosis Research Society has recommended annual scoliosis screening of all children age 10–14 years.

- The authors suggest that **an effective school scoliosis screening program** should be implemented in the Korea **school screening regulations**, and the **specific time of scoliosis screening examination** should be determined according to **age specific characteristics** of IS by **gender difference**.

Discussion (2)

- **The self-image/appearance domain score was significantly different with different severity groups.**

- Among SRS-22r sub-domai...

- The function/activity ...

- The self-image/appe... ...ut of 5).

- The severe IS group had si... ...an the mild and moderate IS groups.

- Study participants were mainly female adolescents interested in their body image as a developmental factor.

We should be aware of how IS adolescents perceive their self-image/appearance by the severity of their spinal curvature.

Discussion (3)

- The overall mean SRS-22r score was 4.2 out of 5 among study participants receiving conservative treatments.

- **The mean SRS-22r score did not differ by severity in this study** even though the me... increasing spinal curv...

  Larger and even sample sizes in each severity group could uncover a greater range of HRQoL characteristics in Korean IS adolescents.

- May Causes

  - The **sample size** was relatively <u>small</u> and the number of patients in each severity group was <u>uneven</u>

  - All participants were **conservatively treated**

Conclusion

- **Korean adolescents** with idiopathic scoliosis tend to be diagnosed at an **early pubertal period (late elementary school age).** This indicates that the prevalent age for AIS is slightly earlier than 13 years old in Korean adolescents, demonstrating **the need for early AIS screening examination.**

- Total score of HRQoL (SRS-22r) was not influenced by disease severity, but **self-image/appearance was significantly different with differing severity.**

Conclusion – Cont.

- Medical staff should be aware of the characteristics of Korean AIS and variation in the HRQoL characteristics of adolescents with idiopathic scoliosis based upon severity of AIS.

- To enhance the HRQoL of idiopathic scoliosis adolescents, medical staff should consider **developing strategies tailored to individuals based on disease severity.**

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