

Does E-PASS (The Estimation of Physiologic Ability and Surgical Stress) scoring system help the prediction of postoperative complications in lumbar spinal surgery for elderly patients?

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Introduction

A predictive scoring system designated as **E-PASS**:
72 patients over 80 years who underwent gastrectomy

CRS \geq 0.5 : The rate of morbidity: 45.0%

mortality: 20.0%

(Haga *et al.*, Surgery Today, 1999)

24 patients with lumbar surgery over 80 years

E-PASS: There was significantly correlation
between postoperative complication and CRS

(Maeda *et al.*, Tohoku Seisai, 2009, in Japanese)

Purpose

To evaluate the surgical stress and postoperative risk for elderly patients in lumbar spinal surgery using E-PASS scoring system.

Patients

2000 - 2010 172 patients over 65 years

(79 males and 93 females)

Mean age at surgery: 78 years (65-90 years)

Operation time: 141 min (39-375 min)

Blood loss: 245 g (5-2030 g)

All patients underwent lumbar spinal surgeries.

The postoperative complications

Complication (group C): 31 pts.

No complication (group N): 141 pts.

Methods

E-PASS

1. Preoperative Risk Score (PRS)

$$\text{PRS} = -0.086 + 0.0345X_1 + 0.323X_2 + 0.205X_3 + 0.153X_4 + 0.148X_5 + 0.0666X_6$$

X1: age, X2: presence (1) or absence (0) of severe heart disease

X3: presence (1) or absence (0) of severe pulmonary disease,

X4: presence (1) or absence (0) of diabetes mellitus,

X5: performance status index (0-4),

X6: American Society of Anesthesiologists physiological status classification (1-5)

2. Surgical Stress Score (SSS)

$$\text{SSS} = -0.342 + 0.0139X_1 + 0.0392X_2 + 0.352X_3$$

X1: blood loss/ body weight (g/kg), X2: operation time (h)

X3: extent of skin incision

3. Comprehensive Risk Score (CRS)

$$\text{CRS} = -0.328 + 0.936 (\text{PRS}) + 0.976 (\text{SSS})$$

Methods

PRS, SSS, CRS and Japan Orthopaedic Association Score (**JOA score**) between the group C and N were compared using the Mann-Whitney U-test ($p < 0.05$)

Postoperative complication

grade 0: no complication

1: mild complications in the form of wound infection and wound dehiscence

2: moderate complications that were potentially life-threatening unless adequate treatment was initiated, including pneumonia

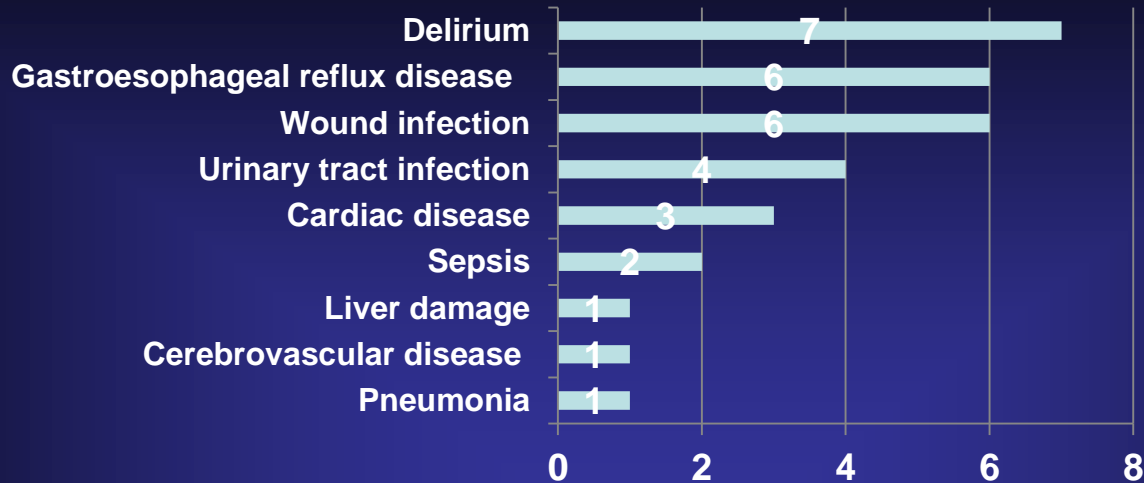
3: severe organ dysfunction

4: in-hospital death due to the complication

The correlation between the degree of the complication and the PRS, SSS and CRS was analyzed by Spearman's correlation coefficient by rank.

Results 1

Postoperative Complications

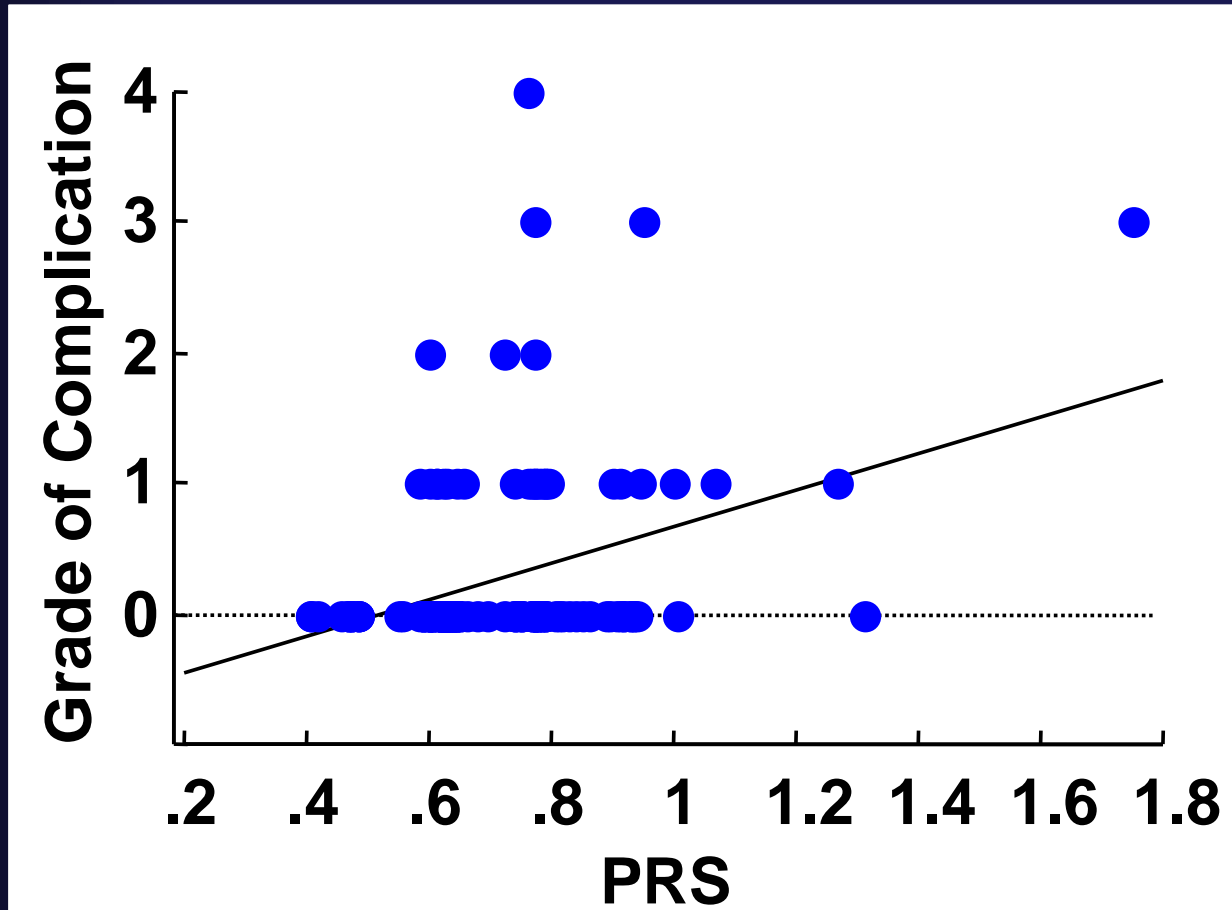


Comparison of Group C (complication) vs Group N (no complication)

	Group C	Group N	p value
Age	77.5	77.6	P=0.4834
Av. op time (min)	139.2	140	P=0.1636
Av. blood loss (g)	385	201	P=0.5058
JOA score	13.5	13.4	P=0.4440
PRS	0.758	0.681	P<0.01
SSS	-0.167	-0.200	P=0.4412
CRS	0.211	0.115	p<0.01

Results 2

Correlation between the PRS and complication

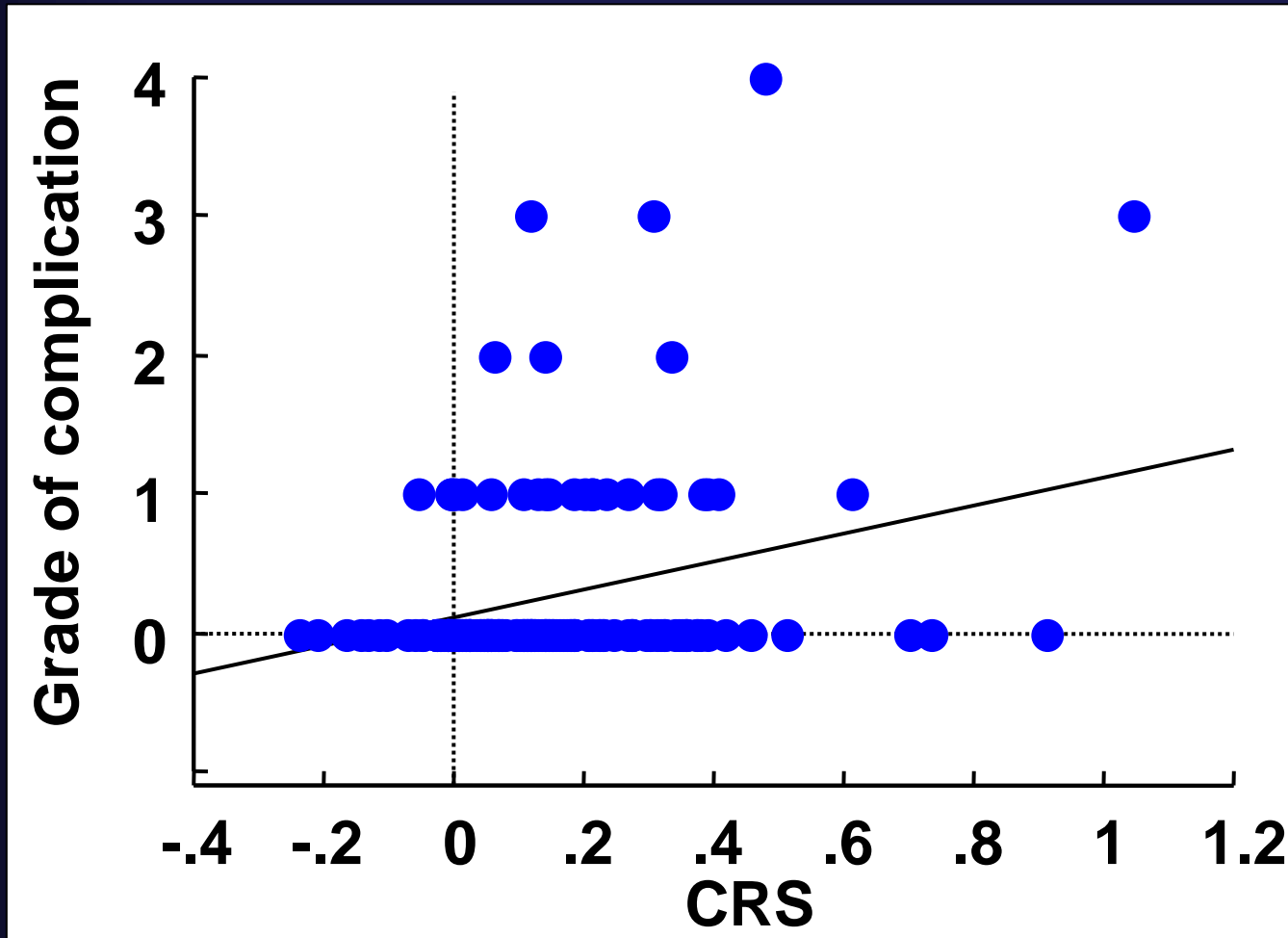


P<0.01

There was significantly correlation between the PRS and complication

Results 3

Correlation between the CRS and complication

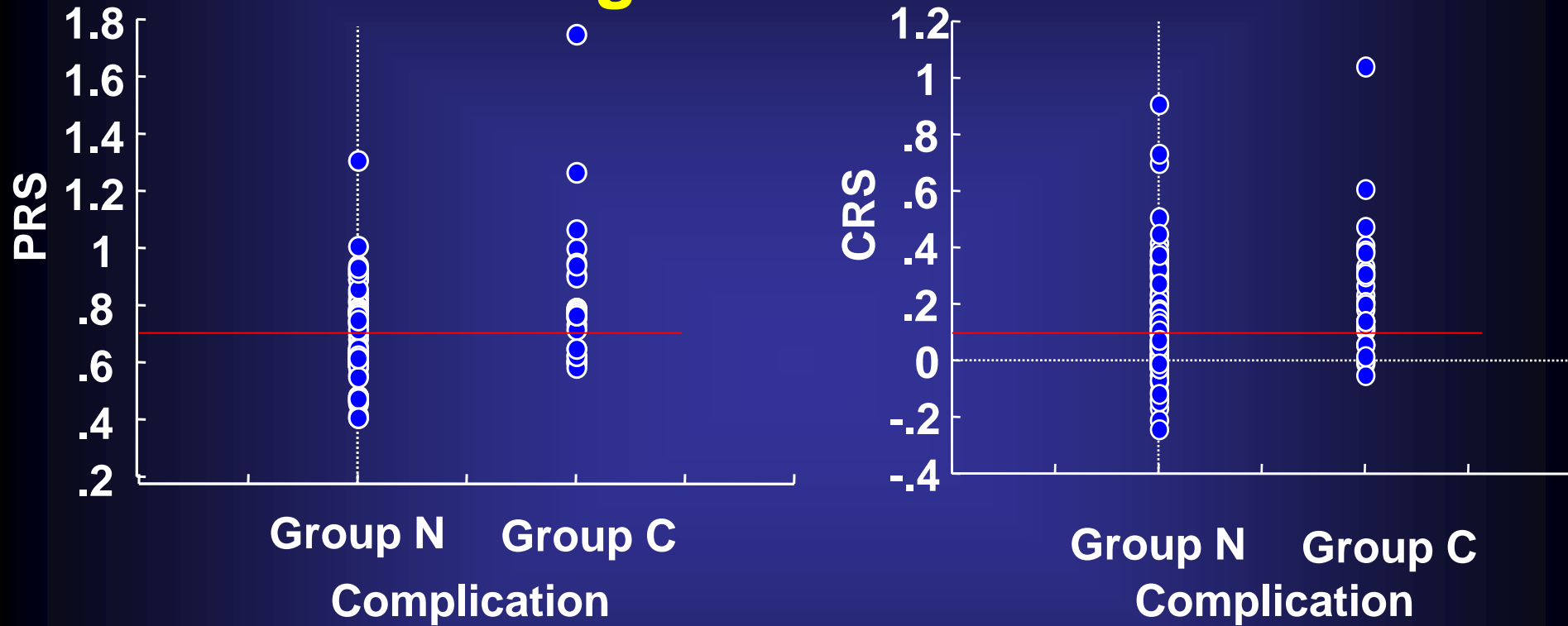


$P < 0.01$

There was significantly correlation between the CRS and complication

Results 4

The rate of postoperative complication using PRS and CRS



PRS > 0.7 31.8%
< 0.7 9.6%

CRS > 0.1 26.1%
< 0.1 9.6%

Conclusion

There was significantly correlation between PRS, CRS and postoperative complication.

The rate of postoperative complication was 31.8% (PRS >0.7) and 26.1% (CRS > 0.1).

We should create the tool such as E-PASS to predict postoperative complications in spinal surgery.

Disclosure information

None of the authors has any potential conflict of interest.

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