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A Validation of the Oswestry Spinal Risk Index

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Background

- Oswestry Spinal Risk Index (OSRI) published in 2013 (Balain et al) aims to predict survival in patients with spinal metastases
- Cohort of 199 patients with spinal metastases
- Primary tumour pathology and general condition most important factors in predicting survival: OSRI = PTP + 1-GC
- Predicted survival important factor when planning treatment
- Less need for lengthy investigations when time is of the essence

Methods

- Salford Royal Foundation Trust neurosurgical database
- Prospectively recorded acute referrals to on call spinal surgery and neurosurgery
- Notes reviewed to identify patients undergoing surgery for spinal metastases between January 2009 & November 2011
- Primary tumours of the spine or intradural tumours excluded

Methods

- 100 patients identified
- Primary Tumour Pathology (PTP) score allocated based on system used by Tomita et al: based on speed of growth of primary tumour
- General condition score allocated with the categories used by Balain et al, based on the Karnofsky Performance Status
- Kaplan-Meier survival analysis conducted to compare survival between patients with varying OSRI scores

Methods

- Median survival times with 95% confidence intervals determined for each OSRI score
- Pairwise comparison of survival between groups assessed using Mantel-Cox log rank statistic
- Nagelkerke's pseudo-R² statistic evaluated for a logistic regression analysis of patient survival using the OSRI score as a predictor

Results

- Mean age 60.3 years (19-88)
- Most common tumour type: breast (n=24) followed by lung (n=20)
- 74 patients died during analysis period
- Analysis undertaken July 2013

Median survival times and confidence intervals for patients with differing OSRI scores

OSRI score	<i>Median survival time (days)</i>	95% CI for survival time (days)
1 (n=12)	>50% survived until end of analysis	>50% survived until end of analysis
2/3 (n=56)	325	140-510
4/5 (n=11)	262	170-354
6 (n=11)	160	55-265
7 (n=10)	58	24-92
All (n=100)	253	165-341

Survival curves for patients with varying OSRI scores



Results

- Nagelkerke's pseudo-R² statistic of 0.145 obtained for logistic regression analysis of patient survival (OSRI score single predictor)
- 0.167 when patient ages were included as a controlling variable
- Balain et al, proposing the OSRI found this score to have a Nagelkerke's R² of 0.28.

Results

- The hazard ratio of 1.75 obtained for the OSRI score indicates that the hazard of death is raised by 75% for each advance in the OSRI classification.
- Using logistic regression (controlled for age model) 76% of patients were correctly classified.

Discussion

- The OSRI is a significant predictor of survival in our patient population
- It is a useful tool when considering surgical treatment for patients with spinal metastases.
- The index has demonstrated good transferability across data sets, self-consistency and predictive capability in a validated study.
- We recommend its use.