Who will benefit from prophylactic cranial irradiation? A case series of 289 limited stage small cell lung cancer.

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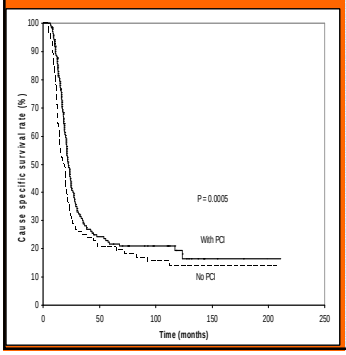
BACKGROUND

Previous clinical studies often reported on a mixed patient population of limited and extensive stage small cell lung cancer (SCLC). Some gave PCI to complete response (CR) patients only while others gave it to both CR and partial response (PR) patients. It is not clear from the literature if partial responders of limited stage SCLC would benefit from PCI.

Fig.1. Cause-specific survival rate of whole group (289 patients)



METHODOLOGY

Search of the population-based Canadian Saskatchewan provincial registry from 1981 through 2007 was performed. Patients were treated with chest radiotherapy and chemotherapy with or without PCI (typical doses: 2500 cGy/10 fractions/2 weeks, 3000 cGy/15 fractions/3 weeks, or 3000 cGy/10 fractions/2 weeks).

RESULTS

There were 289 limited stage SCLC patients radically treated for curative intent, of which 177/289 (61.2%) had PCI. For the whole group of 289 patients, PCI resulted in OS and CSS benefit (P=0.0011 and 0.0005, respectively) but not significant in the subgroup analysis of 185 CR or 93 PR patients. For the whole group of patients, the time to symptoms of first recurrence at any site, with or without PCI were significantly different: 13.7 vs 10.6 months (P=0.0006). PCI significantly delayed the time to symptoms of first recurrence in the brain: 20.7 *vs* 10.6 months (P<0.0001). The first site of metastasis was in the brain for 12.5% (6/48) and 45.5% (5/11) CR patients with and without PCI respectively (P=0.02); 6.1% (2/33) and 27.6% (8/29) PR patients with and without PCI (P=0.05).

Table 1. Overall rates of brain recurrence before death

Response after chemo-radiation	PCI	brain met	no brain met	P (chi-sq)
CR N=185	yes	24	108	0.0085
	no	20	33	
PR N=93	yes	11	31	0.91
	no	15	36	

Table 2. Overall survival rates

	PCI	1 year OS	2 year OS	Wilcoxon test, P
All patients N=289	yes	89%	48%	0.0011
	no	76%	32%	
CR patients N=185	yes	93%	55%	0.1
	no	85%	37%	
PR patients N=93	yes	74%	21%	0.39
	no	59%	28%	

CONCLUSION

PR patients benefit from PCI, in terms of reduced rate and delayed time for development of brain metastases, although without significant OS or CSS benefit in this study.

As it is difficult to differentiate CR from PR patients accurately despite modern imaging, the authors recommend PCI to be given to both CR and PR patients.