

**Ewing Sarcoma: Only patients with 100% of necrosis after adjuvant chemotherapy should be classified as good responders.**

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**Abstract**

**Purpose:** The purpose of this study is to review a large cohort of patients and further assess the correlation between histological responses to chemotherapy in Ewing's sarcoma with overall survival and local recurrence.

**Methods:** All patients treated for Ewing's sarcoma at our hospital between 1980 and 2012 were identified and reviewed from the prospectively collated oncology database. Patients with no metastasis at diagnoses, treated with neo adjuvant chemotherapy, oncologic surgery and a minimum of 2 years follow up were included. Three hundred and eight patients were included in the study. The median age at diagnosis was 17 years (1-62) and the mean follow up was 103 months (6-385). Patients were grouped according to the percentage of necrosis: Group I: 0-50%, Group II: 51-99% and Group III: 100%.

**Results:** Overall survival and event free survival of the series were 72% and 61% at 5 years. Significant differences in 5-year overall survival (5yOS) were found regarding necrosis between 0-50% (5yOS 46%, 95%CI 35-58) vs 51-99% (5yOS 69%, 95%CI 61-78) vs 100% (5yOS 93%, 95%CI 88-98) ( $p < 0.0001$ ). Event free local recurrence was 85.5% at 5 years. The median time to develop local

recurrence was 25 months (range 7 to 150 months) and with no differences in respect to histological response to neo-adjuvant chemotherapy ( $p=0.16$ ).

**Conclusion:** Only patients with 100% of necrosis after neo-adjuvant chemotherapy and surgical resection should be classified as good responders because they presented significantly higher survival rates compared to patients with any amount of viable tumour in the resected specimen.

**Level of evidence:** II

**Key words:** Ewing's sarcoma, histological response, chemotherapy necrosis, survival, local recurrence.