Eur J Cancer, Vol. 28A, No. 10, p. 1773, 1992.
Printed in Great Britain
0964-1947/92 $5.00 + 0.00


# Mediastinal Non-seminomatous Germ Cell Tumours: Effectiveness of Platinum, Etoposide, Bleomycin Combination Chemotherapy Plus Adjunctive Surgery

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PLATINUM, ETOPOSIDE and bleomycin combination chemotherapy (PEB) is considered the first choice of treatment for disseminated germ cell tumours in many centres [1]. It is reportedly superior to other drug combinations [2], particularly in patients with a large tumour volume.

Primary mediastinal non-seminomatous germ cell tumours (MNSGCT) are quite rare and account for only 1–2% of all germ cell tumours in males [3]. MNSGCT have distinct clinical, pathological and response characteristics when compared with testicular and retroperitoneal counterparts [4].

From September 1989 to September 1991, we treated 6 patients bearing MNSGCT (size 5–20 cm) with PEB + surgery. Patients' characteristics are summarised in Table 1.

Histological diagnosis of non-seminomatous germ cell tumours was obtained from mediastinoscopy with mediastinic biopsy. Patients with testicular primary tumours or with retroperitoneal adenopathy were not considered in this series. No patients were previously treated with chemotherapy and/or radiotherapy. PEB consisted of a 3-week course of platinum 20 mg/m$^2$ on days 1–5; etoposide 100 mg/m$^2$ on days 1–5; and bleomycin 30 mg on days 2, 9, 16. Bleomycin administration was stopped after a maximum of four courses. A median of four PEB courses were administered (range 3–6). Toxicity was acceptable as previously reported [2], never obliging us to withdraw the treatment.

1 patient achieved a clinical and pathological complete response, lasting 9+ months, after chemotherapy alone. The remaining 5 patients attained a clinical partial response, with normalisation of previously elevated tumour markers and 4 of them underwent complete surgical resection of residual masses. They became disease-free lasting 16+, 7+, 6+ and 1+ months, respectively. The post-chemotherapy histology revealed only mature teratoma and fibrosis in all patients. 1 patient with a persisting unresectable mediastinal mass was referred for salvage therapy (platinum, etoposide, ifosfamide) + radiotherapy and died from progressive disease after 18 months.

*Table 1. Patients' characteristics*

| | |
|---|---|
| No. of patients | 6 |
| Age (years) | |
| Median | 17 |
| Range | 16–52 |
| Sex | |
| Male | 4 |
| Female | 2 |
| Performance status (ECOG) | |
| Median | 1 |
| Range | 0–3 |
| Histology | |
| Teratocarcinoma | 5 |
| Teratocarcinoma plus seminoma | 1 |
| Markers | |
| Elevated Beta-hCG (U/l)* | 1/6 (176) |
| Elevated AFP (ng/ml)† | 3/6 (629, 2937, 35000) |
| Elevated LDH (U/l)‡ | 2/6 (635, 702) |

*Beta-hCG: Beta-human chorionic gonadotropin.
†AFP: Alpha-fetoprotein.
‡LDH: Lactic dehydrogenase.

Due to the rare presentation, MNSGCT represent a controversial area. Two large series of patients treated with chemotherapy, followed in some cases by surgery, have been recently published [5, 6]. Disease-free status was attained in 56% (5) and 42% (6) of patients. These series, however, varied considerably with regard to type of therapy, dose and schedule, although all patients received cisplatin-based combination chemotherapy.

Our data show that the PEB regimen induced a low complete response rate (1/6 patients). After adjunctive surgery, however, a high number of patients (5/6) attained the disease-free status without any malignant non-seminomatous germ cell elements at the post-chemotherapy histology. The results of the present study (80% disease-free patients) seem to be superior to those of the two aforementioned experiences. Possible differences in response rate may reflect different patient populations, i.e. the absence of yolk salk tumours in our series. However, the lower percentage of patients attaining the disease-free status in the published MNSGCT series [5, 6] is possibly influenced by the heterogenity and probably less efficacy of treatments administered. In fact, at the Indiana University [5], 8 out of 11 patients (70%) were rendered disease-free with PEB plus surgery in comparison with 10 out of 20 (50%) who received other combination chemotherapy. So PEB has to be considered the first choice of treatment for MNSGCT.

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Revised 23 Mar. 1992; accepted 31 Mar. 1992

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