occurring among 8 cases who were treated with electron energy of 12 MeV or higher.

Conclusions: Local RT for PONHL is very effective in achieving local control, and close long-term follow-up is warranted considering late distant relapse and morbidity. Lens shielding and use of electron energy lower than 12 MeV are important technical factors to be kept in mind to decrease late morbidity risk.

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Antileukemic and cytogenetic effects of two chemotherapeutic schemes CHOP and AHOP (A= aza-steroidal alkylating ester)

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Purpose: CHOP is one of the most well established and widely used chemotherapeutic schemes against lymphomas. Although CHOP has been proved highly effective, its genotoxic activity produces a high percentage of secondary tumors. Our previous studies on the antileukemic activity of an homo-aza-steroidal alkylating ester (ASE), showed good results, lower genotoxicity than cyclophosphamide and synergism with anthracycline activity. In this study we adjusted CHOP on mice for the treatment of P388 and L1210 leukemias and comparatively we adopted ASE in CHOP in replacement of cyclophosphamide, creating a new experimental treatment scheme (AHOP).

Methods: BDF1 mice were used for the evaluation of the antileukemic activity. Experiments were initiated on day 0 by implanting i.p. of 10^5 and 10^6 ascites cells of lymphoid L1210 and lymphocytic P388 leukemias. Administration was begun either on day 1 as a single injection of CHOP(C= 112, H=7.5, O= 0.21, P= 15 mg/kg) and AHOP (A= 13, H= 7.5, O= 0.21, P= 15 mg/kg) or on day 5 for P388. The antitumor activity was assessed from the oncostatic parameter T/C%. For the cytogenetic experiments 1 h before i.p. injection of 5-bromodeoxyuridine adsorbed to activated charcoal P388 tumor bearing mice treated i.p. with either CHOP or AHOP, at 1/10 of the dose giving for the surviving testing, were investigated for sister chromatid exchange (SCE) rates and proliferation rate indices (PRI).

Results: Three groups of P388 and L1210 leukemias were treated with CHOP and AHOP. Both treatment schemes were highly effective, causing 100% cures (6/6), when leukemias P388 and L1210 were treated on day 1 post transplantation. They, also, showed significant antileukemic effect producing T/C values of 308 and 257% for CHOP and AHOP, respectively, when advanced P388 leukemia on day 5 was treated. Both schemes produced significant increases in SCE-s however AHOP induced higher SCE frequencies and lower PRI levels than CHOP in P388 leukemic cells in vivo.

Conclusion: Both treatment schemes were determined to be extremely effective and the therapeutic activity depends on the treatment schedule (day 1, day 5) where CHOP was slightly more effective than AHOP in advanced P388 leukemia. However, the most effective scheme in inducing cytogenetic effect was CHOP. This study is in progress and these preliminary results should be investigated furthermore as a potential antitumor scheme.

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Incidence of anemia in CHOP-treated intermediate-Grade Non-Hodgkin's Lymphoma (IGNHL)

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Purpose: To evaluate the CHOP therapy-induced anemia rates and associated factors in IGNHL.

Methods: A practice pattern study was conducted at twelve community and academic oncology sites. Data on 591 IGNHL patients treated with CHOP chemotherapy were retrospectively collected. Data on patients with available baseline chemotherapy hemoglobin (Hb) value were analyzed (546 patients).

Results: The overall mean drop in Hb from baseline to the lowest value measured during chemotherapy was 2.3 g/dl (95% confidence interval, 2.18, 2.46). Of the 353 patients who had a normal Hb (> 12.0) at baseline, 28.3% (100 patients) developed moderate to severe anemia (< 10 g/dL) during chemotherapy and patients 60 years and older had a significantly higher risk (odds ratio 2.5) of developing anemia. Examining the persistence of anemia throughout all chemotherapy cycles shows that of the 62/546 patients with baseline Hb <10 g/dl, 47.5% of the patients failed to recover to a ≥ 10 level during chemotherapy. Anemia treatment data were not available. Similarly, 131/546 patients whose baseline Hb was between 10-12 g/dl dropped below the Hb level of 10. In addition, anemia and neutropenia were found to be significantly associated. Among patients who developed anemia, there was a higher incidence of patients with febrile-neutropenia (FN). FN was documented in patient charts by their treating physician. The following table summarizes the distribution of patients with anemia (chemotherapy-induced) and documented FN.

NCI Anemia Scale	Hb (g/dL)	Total N (%)	Documented FN n (% of N)
Grade 0 (WNL)	> 12.0	95 (17.4)	7 (7.4)
Grade 1 (mild)	10 - 11.9	209 (38.3)	43 (20.6)
Grade 2 (moderate)	8 -9.9	181 (33.2)	74 (40.9)
Grade 3 & 4 (serious to life-threatening)	< 8.0	61 (11.2)	32 (52.5)

NCI Anemia Scale: National Cancer Institute anemia grading scale. WNL: Within normal limits. N: No. of patients in each anemia grade. n: No. of patients in each grade anemia grade with documented FN

Conclusion: Treatment of IGNHL patients with CHOP chemotherapy results in anemia. Also, there is an association between CHOP induced anemia and FN.

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Modified ESHAP as salvage chemotherapy for recurrent or refractory non-Hodgkin's lymphoma: experience at Hacettepe university and a review of the literature

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We have evaluated the clinical efficacy and toxicity of a modified etoposide, methylprednisolone, cytarabine and cisplatin (ESHAP) chemotherapy regimen that has been used by the Hacettepe University Department of Medical Oncology (Ankara, Turkey) since 1993. Thirty-two patients (18 men and 14 women) with refractory or recurrent non-Hodgkin's lymphoma (NHL) were enrolled in this study. The median age of patients were 39 years (range, 21-66 years). Patients were hospitalized during therapy. On the first day, 2 g/m2 cytarabine was given, followed on days 2-5 by 60 mg/m2 etoposide, 500 mg methylprednisolone, and 25 mg/m2 cisplatin. After two cycles of chemotherapy clinical efficacy was assessed by clinical examination, chest radiography, ultrasonography and/or computed tomography. The complications were assessed on the basis of the WHO criteria. Nine patients (28.1%) had a complete response (CR), and 8 (25%) had partial response (PR). In responders, the median duration of remission was 6 months. By the end of the first year, 27% of the patients were still disease-free, and 66% were alive. High serum levels of lactate dehydrogenase had an adverse effect on disease-free survival (DFS), but no effect on overall survival (OS). The only unfavorable prognostic factor for OS was the presence of bulky disease. Neutropenia developed in 59% of patients, and febrile neutropenia developed in 74% of these patients, requiring hospitalization for an average of 8 days. Three patients died of neutropenia-associated sepsis despite broad-spectrum antibacterial and antifungal treatment. Thrombocytopenia was detected in 10 patients and anemia in three patients; among these, seven patients with thrombocytopenia and one patient with anemia required transfusions. The modified ESHAP regimen induced remission in more than half of the patients with refractory or recurrent NHL. However, the duration of remission was brief. Moreover, significant myelotoxicity was common, and the risk of treatment-related death was 9%.

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Thyroid pathology among long-term survivors from Hodgkin's disease (HD)

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Purpose: As a result of the high cure rates and relatively young age of HD patients at the time of diagnosis there are many long-term survivors who