Intraventricular chemotherapy

Intraventricular chemotherapy for patients with LMC from non-small-cell lung cancer could palliate associated symptoms and prolong patients' survival. Careful selection of patients for intraventricular chemotherapy is recommended with aggressive ICP control and concurrent systemic chemotherapy [1].

To assess the benefit of intraventricular chemotherapy, patients with leptomeningeal metastasis (LM) from breast cancer were randomised to treatment including intraventricular (IT) chemotherapy (n=17) or to non-intrathecal (non-IT) treatment (n=18). Appropriate systemic therapy and involved field radiation therapy (RT) were given in both arms. Intention-to-treat analysis showed neurological improvement or stabilisation in 59% of the IT and in 67% of the non-IT group, with median time to progression of 23 weeks (IT) and 24 weeks (non-IT). Median survival of IT patients was 18.3 weeks and 30.3 weeks for non-IT patients (difference 12.9 weeks; 95% Confidence Interval (CI) -5.5 to +34.3 weeks; P=0.32). Neurological complications of treatment occurred in 47% (IT) vs 6% (non-IT) (P=0.0072). In conclusion, standard systemic chemotherapy with involved field RT for LM from breast cancer is feasible. Addition of intraventricular chemotherapy does not lead to survival benefit or improved neurological response, and is associated with an increased risk of neurotoxicity [2].

One hundred twenty consecutive patients with LM (71 females and 49 males) ranging in age from 10 to 72 years (median 42 years) were treated with involved-field radiotherapy and intraventricular chemotherapy using an Ommaya reservoir and intraventricular catheter system. The diagnosis of LM was determined by a combination of clinical presentation (114 patients); cerebrospinal fluid cytological studies (100); or neuroradiographic studies (42). Systemic tumor histological findings included breast (34 patients); non-Hodgkin's lymphoma (22); melanoma (16); primitive neuroectodermal tumors including medulloblastoma (10); glial neoplasms, leukemia, small cell lung, nonsmall cell lung, and colon (six each); prostate and kidney (three each); and gastric cancers (two). Sixteen patients, all with non-Hodgkin's lymphoma, also had acquired immune deficiency syndrome. Patients received one to four (median two) chemotherapeutic drugs and underwent a total of 1110 cycles of intraventricular chemotherapy (median 10). Intraventricular chemotherapy administration and diagnostic Ommaya reservoir punctures totaled 4400, with a median of 46 per patient. Complications included aseptic/chemical meningitis (52 patients); myelosuppression due to intraventricular chemotherapy (21); catheter-related infections (nine); unidirectional catheter obstruction (six); intraventricular catheter malpositioning (two); Ommaya reservoir exposure (two); leukoencephalopathy (two); and chemotherapy-related myelopathy (one). There were no treatment-related deaths; however, seven patients (6%) required additional surgery for either catheter repositioning (two) or reservoir removal (five). Seven patients with catheter-related infections were treated successfully with intraventricular and systemic antibiotic drugs, thereby preserving the Ommaya system. The authors conclude that Ommaya reservoirs are convenient and pharmacologically rational systems for administering intraventricular chemotherapy. Overall, serious complications requiring surgery are infrequent (6%) and most often secondary to catheter infections, Ommaya reservoir exposure, or initial catheter malpositioning. In the majority of instances, catheter infections may be managed medically, as may the most common complications of intraventricular chemotherapy including aseptic meningitis (43% of patients) and myelosuppression (18%) [3].

1)

Gwak HS, Joo J, Kim S, Yoo H, Shin SH, Han JY, Kim HT, Lee JS, Lee SH. Analysis of treatment outcomes of intraventricular chemotherapy in 105 patients for leptomeningeal carcinomatosis from non-small-cell lung cancer. J Thorac Oncol. 2013 May;8(5):599-605. doi: 10.1097/JTO.0b013e318287c943. PubMed PMID: 23422833.

2) Boogerd W, van den Bent MJ, Koehler PJ, Heimans JJ, van der Sande JJ, Aaronson NK, Hart AA, Benraadt J, Vecht ChJ. The relevance of intraventricular chemotherapy for leptomeningeal metastasis in breast cancer: a randomised study. Eur J Cancer. 2004 Dec;40(18):2726-33. PubMed PMID: 15571954.

3) Chamberlain MC, Kormanik PA, Barba D. Complications associated with intraventricular chemotherapy in patients with leptomeningeal metastases. J Neurosurg. 1997 Nov;87(5):694-9. PubMed PMID: 9347977.