in preventing delayed emesis: complete or major control of vomiting in 86–100% of patients of both treatment groups (Table 1). There were no noteworthy changes in clinical and laboratory parameters. Headache, asthenia or sedation were reported by 6 patients receiving tropisetron and by 4 receiving alizapride.

In conclusion, our results confirm that tropisetron is a well-tolerated and manageable anti-emetic drug. Its efficacy is superior to that of alizapride, at least in the control of acute emesis.

1. Bateman DN, Rawlins MD, Simpson JM. Extrapyramidal reactions with metoclopramide. *Br Med J* 1985, **291**, 930–932.
2. Sheridan C, Chandra P, Jacinto M, Greenwald ES. Transient hypertension after high doses of metoclopramide. *N Engl J Med* 1982, **307**, 1346.
3. Joss RA, Galeazzi RL, Bischoff AK, Pirovino M, Ryssel HJ, Brunner KW. The antiemetic activity of high-dose alizapride and high-dose metoclopramide in patients receiving cancer chemotherapy: a prospective, randomized, double-blind trial. *Clin Pharmacol Ther* 1986, **39**, 619–624.
4. Tagnon HJ, ed. Proceedings of the ondansetron symposium. *Eur J Cancer Clin Oncol* 1989, **25** (Suppl. 1).
5. Plosker GL, Goa KL. Granisetron. A review of its pharmacological properties and therapeutic use as an antiemetic. *Drugs* 1991, **42**, 805–824.
6. Gamse R. Antiemetic action of 5-HT_3 receptor antagonists: review of preclinical and clinical results with ICS 205-930. *Cancer Treat Rev* 1990, **17**, 301–305.
7. First international symposium on tropisetron. *Drugs* 1992, **43** (Suppl. 3), 1–44.
8. Schmoll HJ. The role of ondansetron in the treatment of emesis induced by non cisplatin-containing chemotherapy regimens. *Eur J Cancer Clin Oncol* 1989, **25** (Suppl. 1), 535–539.
9. Smith IE. A comparison of two dose levels of granisetron in patients receiving moderately emetogenic cytostatic chemotherapy. The granisetron study group. *Eur J Cancer* 1990, **26** (Suppl. 1), 519–523.

European Journal of Cancer Vol. 30A, No. 12, pp. 1903–1904, 1994.
Elsevier Science Ltd
Printed in Great Britain
0959–8049/94 $7.00 + 0.00

0959-8049(94)00272-X

The Treatment of Progressive Ovarian Carcinoma With D-Trp-LHRH (Decapeptyl)

F. Carnino, L. Iskra, G. Fuda, G. Foglia, F. Odicino, M. Bruzzone, S. Chiara, A. Gadducci and N. Ragni for the Gruppo Oncologico Nord ovest (GONO)

Several authors [1–4] have shown the presence of follicle-stimulating hormone (FSH) and luteinising hormone (LH) receptors in malignant tumours of the ovary. Parmar [5] has shown gonadotropin level reduction in ovarian carcinomas with the administration of luteinising hormone releasing hormone (LHRH) agonists. Emons [4] postulates that LHRH analogues could act in epithelial ovarian carcinoma patients through two mechanisms: (a) suppressed FSH and LH secretion and removal of a possible proliferation stimulus, (b) direct inhibitory effect on tumour cells through LHRH receptors. These experimental data led us to investigate the use of a LHRH agonist for advanced ovarian carcinomas.

We treated 20 epithelial ovarian carcinoma patients, already submitted to surgery, with stable or progressive disease after lines I, II and III chemotherapy or relapsing within 6 months after line I chemotherapy. All patients were menopausal with an average age of 60 years.

Triptoreline (D-Trp-6-GnRh) at a dose of 3.75 mg was administered intramuscularly every 4 weeks until progression. 5 patients could not be assessed as they died within the first 8 weeks of observation due to rapid disease progression. 7 of the 15 assessable patients received line II chemotherapy, 3 also received line III and 5 only line I (Table 1).

No remission was observed; 14 stabilisations were achieved and only one progression occurred (the only Brenner tumour of the series). The longest stabilisations were observed in progression patients after complete remission following line I chemotherapy and not submitted to further treatment (patients 9 and 11). Drug tolerance was excellent, only three hot flushes and two not certainly drug-dependent gastrointestinal disturbances occurred.

Many attempts have been made to cure epithelial ovarian carcinomas with hormone therapy. Bruckner [6] treated 5 advanced ovarian carcinoma patients with leuprolide acetate (gonadotropin releasing hormone analogue) associated with megestrol acetate to minimise the potentially adverse effects of leuprolide acetate and reported one complete response, two partial responses and two stabilisations. Kavanagh [7] reported four partial responses (17%) and two stabilisations in a series of 18 assessable epithelial ovarian carcinoma patients treated with leuprolide acetate. Parmar [5] reported six partial remissions and five stabilisations with triptoreline administered to 39 advanced epithelial carcinoma patients. Jager [8] treated 19 advanced epithelial ovarian carcinomas with triptoreline and observed stabilisation for over 20 months in 12 patients (63%).

No responses were observed in our series but the large number of some long duration stabilisations should not be discounted. It should also be noted that prognosis for all our patients was extremely unfavourable for tumour stage or previous II or III line chemotherapy, residual tumour and grading; for this last factor, Kavanagh [7] postulated that LHRH analogues only have anti-tumoral effects in well-differentiated tumours.

Considering the negligible toxic action of triptoreline and low response percentage observed with chemotherapy regimes used as a second- or third-line at the expense of high toxicity levels, the use of this drug for ovarian advanced carcinoma patients after conventional treatment or the association of Decapeptyl with conventional cisplatin-containing line I chemotherapy as proposed by Emons in a randomised study [9] seems to be well-founded.

Correspondence to F. Carnino.
F. Carnino, L. Iskra and G. Fuda are at the Ospedale Ostetrico-Ginecologico S.Anna, Corso Spezia 60-10126, Torino; N. Ragni, G. Foglia and F. Odicino are at the Clinica Ostetrico-Ginecologica Università di Genova (I); M. Bruzzone and S. Chiara are at the Istituto Nazionale per la ricerca sul cancro Genova (I); and A. Gadducci is at the Clinica Ostetrico-Ginecologia Università di Pisa (I), Italy.
Revised 30 Mar. 1994; accepted 17 May 1994.

1. Rajaniemi H, Kaupilla A, Ronneberg L, Selander K, Pystynen P. LH(hCG)receptors in benign and malignant tumors of human ovary. *Acta Obstet Gynecol Scand* 1981, **101** (suppl.), 83–86.
2. Kammerman S, Demopoulos RJ, Raphael CR, Ross J. Gonadotropic

Table 1. Patients' characteristics and results

Patient no.	Stage	Histological	Grading	Residual tumour (cm)	CT I line	Response	CT II line	Response	CT III line	Response	Response (months) Decapeptyl
1	IIIC	Brenner	3	>2	PC (6 cycles)	7	C8DCA (6 cycles)	PR	—	—	P
2	IIIC	Serous	2	>2	PEC (6 cycles)	CR	ALKERAN (4 cycles)	P	—	—	S(6)*
3	IV	?	×	?	PEC (7 cycles)	?	—	—	—	—	S(3)
4	IIIC	Serous	2	>5	PEC (6 cycles)	PR	C8DCA i.p. (3 cycles)	CR	—	—	S(5)
5	IIIC	Serous	3	>5	PEC (6 cycles)	PR	C8DCA i.p. + IFN i.p.	PR	RT ALKERAN CDDP	S	S(6)
6	IIIC	?	×	?	PAC (9 cycles)	CR	C8DCA i.p. + IFN i.p.	PR	ESAMETILM CDDP	PR	S(3)
7	IIIC	Serous	3	>5	ALKERAN (4 cycles)	S	—	—	—	—	S(3)
8	IIIC	Serous	2	>2	PAC (6 cycles)	CR	CDDP 100 (3 cycles)	S	—	—	S(5)+
9	IIIC	Serous	3	>5	PEC (6 cycles)	CR	—	—	—	—	S(10)+
10	IIIC	Serous	3	>5	PEC (6 cycles)	PR	—	—	—	—	S(7)
11	IIIC	Serous	3	>5	PEC (6 cycles)	CR	—	—	—	—	S(9)
12	IV	Serous	3	>2	PC (9 cycles)	CR	C8DCA i.p. (3 cycles)	S	—	—	S(6)
13	IIIC	Serous	3	>5	PEC (6 cycles)	PR	C8DCA i.p. (3 cycles)	CR	—	—	S(3)
14	IIIC	Serous	3	>5	C8DCA + EDX (6 cycles)	S	C8DCA 400 + VP16	S→P	C8DCA (8 cycles)	S→P	S(2)
15	IIIC	Serous	3	>2	CDDP (6 cycles)	P	C8DCA (2 cycles)	P	—	—	S(3)

CT, chemotherapy; PC = CDDP 50 mg/m² + EDX 600 mg/m²; PEC = CDDP 50 mg/m² + EPIDOX 60 mg/m² + EDX 600 mg/m²; PAC = CDDP 50 mg/m² + DOX 45 mg/m² + EDX 600 mg/m²; CR, complete response; PR, partial response; i.p., intraperitoneally; IFN, interferon-α2; RT, radiotherapy.

hormone binding to human ovarian tumors. *Human Path* 1981, **12**, 886–890.

3. Nakano R, Kitagama S, Yamoto M, Shima K, Ooshima A. Localization of gonadotropin binding sites in human ovarian neoplasm. *Am J Obstet Gynec* 1989, **161**, 905–910.
4. Emons G, Pahwa GS, Orfmann O, Knuppen R, Oberheuser F, Schulz KD. LHRH-receptors and LHRH-agonist treatment in ovarian cancer: an overview. *J Steroid Biochem Molec Biol* 1990, **37**, 1003–1006.
5. Parmar H, Rustin F, Lightman SL, Phillips RH, Hanham JW, Schally AV. Response to D-Trp-6-luteinizing hormone (Decapeptyl) microcapsules in advanced ovarian cancer. *Br Med J* 1988, **296**, 1229.
6. Bruckner HW, Motwani BT. Treatment of advanced refractory ovarian carcinoma with a gonadotropin-releasing hormone analogue. *Am J Obstet Gynec* 1989, **161**, 1216–1218.
7. Kavanagh JJ, Roberts W, Townsend P, Hewitt S. Leuprolide acetate in treatment of refractory or persistent epithelial ovarian cancer. *J Clin Oncol* 1989, **161**, 115–118.
8. Jager W, Wild L, Lang N. Some observation on effects of a GnRH analog in ovarian cancer. *Eur J Obstet Gynecol Reprod Biol* 1989, **32**, 137–148.
9. Emons G, Orfmann O, Pahwa GS, Oberheuser F, Schulz KD. LH-Rh agonist in the treatment of ovarian cancer. In *Peptides in Oncology*. I° LH-RH Agonist and Antagonist. Springer-Verlag, 1982, 55–68.