PLASMA PROLACTIN LEVELS BEFORE AND DURING PROPRANOLOL TREATMENT IN CHRONIC SCHIZOPHRENIA

Ridges, Lawton, Harper, Ghosh & Hindson (1977) reported the possibility of an early transient increase in serum prolactin after propranolol in chronic schizophrenics whereas Hanssen, Heyden, Sundberg, Wetterberg & Eneroth (1978) found a decrease in serum prolactin in these patients on steady-state doses of propranolol. We have studied basal plasma prolactin levels and the release of prolactin after intravenous metoclopramide (as described by Judd, Lazarus & Smythe, 1976) in five male chronic schizophrenics before and during treatment with propranolol.

All patients were drug free for at least 1 month before being studied. After an overnight fast an intravenous cannula was inserted and the patient allowed to settle for 1 h to overcome the effect of stress on plasma prolactin levels (Noel, Suh, Stone & Frantz, 1972). Three blood samples were then taken through the cannula at 10 min intervals, for plasma prolactin estimation. The mean of these three values was taken as the basal plasma prolactin level. Metoclopramide 2.5 mg was injected intravenously via the cannula and blood samples for plasma prolactin estimation taken 10, 20, 30, 60, 90 and 120 min later. The patients were then started on propranolol and the dose gradually increased to 1000 mg/day. Estimations of basal and stimulated plasma prolactin levels were repeated after the patients had been on 1000 mg propranolol/day for at least 1 week. The results are shown in Table 1.

The basal plasma prolactin levels were within the normal range (<200 mu/l) for healthy males in three patients and slightly elevated in the other two. Johnstone, Crow & Mashiter (1977) also found elevated prolactin levels in a third of their unmedicated chronic schizophrenics, and these findings are in keeping with a hypersensitivity of certain dopamine receptors and reduced rather than increased central dopaminergic transmission, in some patients with chronic schizophrenia (Bowers, 1974; Chouinard & Jones, 1978). During propranolol treatment plasma

prolactin levels fell in three patients and increased in two. There was a slight fall in the mean level for the five patients, which is in agreement with the finding of Hanssen *et al.* (1978), and compatible with blockade of central serotonin receptors by propranolol. However, Board, Fierro, Wasserman & Bhatnagar (1977) found no effect on basal serum prolactin levels in six patients, with hyperprolactinaemia when propranolol was infused intravenously for 1 h.

The maximum increase in plasma prolactin after metoclopramide, a dopamine antagonist, did not change in one patient, increased in two and decreased in two when on propranolol. The mean increase for the five patients did not change significantly. This finding supports the suggestion that any effect of propranolol on basal plasma prolactin levels in chronic schizophrenia is not mediated by a change in dopamine receptor function.

The clinical response to propranolol is still being studied, but initial comparison of the Brief Psychiatric Rating Scale (Overall & Gorham, 1962) and Wing (1961) ratings at the times of the prolactin studies, before and during propranolol treatment, do not show any marked or consistent changes.

J.D. WILSON

Metabolic Unit, Royal Victoria Hospital, Belfast, Northern Ireland

D.J. KING

Department of Therapeutics and Pharmacology, Queen's University, Belfast and Holywell Hospital, Antrim

B. SHERIDAN

Department of Biochemistry, Royal Victoria Hospital, Belfast, Northern Ireland

Received November 13, 1978

Table 1 Prolactin levels (mean $\pm$ s.e. mean) in five schizophrenic patients before and during treatment with propranolol

Basal plasma prolactin (mu/l)		Maximum increase in plasma prolactin after metoclopramide (mu/l)	
No medication	Propranolol 1000 mg/day	No medication	Propranolol 1000 mg/day
140 $\pm$ 35	110 $\pm$ 20*	940 $\pm$ 275	915 $\pm$ 150*

* paired *t*-test, *P* > 0.05.

References

- BOARD, J.A., FIERRO, R.J., WASSERMAN, A.J. & BHATNAGAR, A.S. (1977). Effects of α - and β -adrenergic blocking agents on serum prolactin levels in women with hyperprolactinaemia and galactorrhoea. *Am. J. Obstet. Gynaec.*, **127**, 285–287.
- BOWERS, M.B. (1974). Central dopamine turnover in schizophrenic syndromes. *Arch. Gen. Psychiat.*, **31**, 50–54.
- CHOUINARD, G. & JONES, B.D. (1978). Schizophrenia as dopamine-deficiency disease. *Lancet*, **ii**, 99–100.
- HANSEN, T., HEYDEN, T., SUNDBERG, L., WETTERBERG, L. & ENEROTH, P. (1978). Decrease in serum-prolactin after propranolol in schizophrenia. *Lancet*, **i**, 101–102.
- JOHNSTONE, E.C., CROW, T.J. & MASHITER, K. (1977). Anterior pituitary hormone secretion in chronic schizophrenia—an approach to neurohumoral mechanisms. *Psychol. Med.*, **7**, 223–228.
- JUDD, S.J., LAZARUS, L. & SMYTHE, G. (1976). Prolactin secretion by metoclopramide in man. *J. clin. Endocrin. Metab.*, **43**, 313–317.
- NOEL, G.L., SUH, H.K., STONE, J.G. & FRANTZ, A.G. (1972). Human prolactin and growth hormone release during surgery and other conditions of stress. *J. clin. Endocrin. Metab.*, **35**, 840–852.
- OVERALL, J.E. & GORHAM, D.R. (1962). The Brief Psychiatric Rating Scale. *Psychol. Repts.*, **10**, 799–812.
- RIDGES, A.P., LAWTON, K., HARPER, P., GHOSH, C. & HINDON, N. (1977). Propranolol in schizophrenia. *Lancet*, **ii**, 986.
- WING, J.K. (1961). A simple and reliable subclassification of chronic schizophrenia. *J. ment. Sci.*, **107**, 862–875.