(p 1150). More appropriate advice was given to pharmacists in the *Pharmaceutical Journal* (Dec 3, 1988, p 707) in a letter from the secretary of the professional advisory committee, British Diabetic Association.

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**FETAL DOPAMINE-RICH MESENCEPHALIC GRAFTS IN PARKINSON'S DISEASE**

*SIR,—During the past year clinical trials with grafting of fetal brain tissue into patients with Parkinson's disease have been initiated but insufficient information is so far available to evaluate the efficacy of these procedures. Our decision to try neural transplantation in Sweden, in a joint clinical experimental programme also involving centres in the UK and USA, was based on 10 years of research with grafted dopamine neurons in experimental parkinsonism. Human-to-rat grafting experiments showed that dopamine neurons from aborted human fetuses of 8–10 weeks' gestation survive transplantation and counteract parkinsonian symptoms. Two women, aged 48 and 55, with Parkinson's disease since 1973 and progressively worsening off–on fluctuations for about 8 years spent 60–70% of their waking hours in the "off" phase at the beginning of the study and were in Hoehn and Yahr stage IV–V. During off periods patient 1 had severe hypokinesia with rigidity and tremor. Most often she was unable to walk. Patient 2 had a very disturbed gait during off periods with much impaired balance, rigidity, and hypokinetic movements.

Immunosuppression (cyclosporin, azathioprine, prednisolone) was given from 2 days before transplantation. Ventral mesencephalic tissue from four fetuses (aged 8–10 weeks) was implanted stereotaxically on the side (left in patient 1, right in patient 2) contralateral to that exhibiting the more severe symptoms. Tissue from one fetus was used for each of two implantation sites in the putamen and tissue from two fetuses for one site in the head of the caudate nucleus. The patients have been on the same doses of antiparkinsonian drugs or the disease itself.

The patients have since 6 months before the operation been kept on a daily log, scoring motor symptoms every 30 min or more frequently. There has been no striking change in the mean time spent "on" during the first 6 postoperative months (for patient 1, preoperative range 31–38%, postoperative 22–44%; for patient 2, preoperative 43–47%, postoperative 45–63%).

We did a battery of timed neurological tests during off periods with the patients on medication. In patient 1 there has been a small but significant bilateral improvement of arm–hand function tests and foot lifting, beginning at about 3 months after transplantation and during the entire postoperative period. Patient 1 takes daily doses of 1200 mg levodopa (combined with benserazide) with 15 mg bromocriptine; patient 2 takes 350 mg levodopa (combined with carbidopa), 15 mg bromocriptine, and 150 mg orphenadrine hydrochloride.

The patients have since 6 months before the operation been kept a daily log, scoring motor symptoms every 30 min or more frequently. There has been no striking change in the mean time spent "on" during the first 6 postoperative months (for patient 1, preoperative range 31–38%, postoperative 22–44%; for patient 2, preoperative 43–47%, postoperative 45–63%).

The duration of the response to a single dose of 100 mg levodopa showed no major changes 6 months after transplantation. Preoperatively, patient 1 was mobile for 60–75 (mean 64) min and postoperatively for 60–90 (mean 73) min. For patient 2 the duration was 105–120 (mean 111) min preoperatively and 90–120 (mean 108) min postoperatively. However, the magnitude of the levodopa response had increased significantly.

Neurophysiological evaluations seem to support a minor improvement in motor function. The motor readiness potential—a slowly rising negative electroencephalographic potential elicited from 1-5 to 0-5 s before a voluntary movement, has been found to be diminished in patients with Parkinson's disease. From 1–2 months postoperatively this potential gradually increased in both patients during off times. The increase was greater over the transplanted hemisphere before movements of the contralateral hand. In patient 1, this voltage rose from less than 1 μV to 7 μV and from less than 1 μV to 3 μV in patient 2. Both patients showed a significant linear rate of increase postoperatively (general linear model, p<0.05).

The PET data point to poor survival of the grafted dopamine neurons. This may have been caused by tissue damage at the implantation site (a fairly thick implantation instrument, outer diameter 2.5 mm, was used); by the long interval (5–6 h) between the abortion and implantation; by rejection; or by adverse effects on the grafted neurons from the antiparkinsonian drugs or the disease itself.

Neural transplantation is still an experimental approach, and not a therapeutic alternative, in Parkinson's disease. Several scientific and technical issues need to be clarified in further animal experiments in parallel with the assessment of different grafting procedures in patients.

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WATERBORNE OUTBREAK OF CRYPTOPOIDIOSIS

Sir,—Despite the fact that Cryptosporidium spp have animal reservoir hosts and are transmitted by the faecal-oral route, Cryptosporidium, unlike Giardia duodenalis, has not yet been acknowledged widely as a significant cause of waterborne gastroenteritis. In 1985, D'Antonio et al. described the first waterborne outbreak, in Texas. Rush et al.2 reported Cryptosporidium, unlike Giardia duodenalis, has not yet been a common source of food or milk or consistent history of animal contamination (244 E coli, 403 coliforms, 58 faecal streptococci per 100 ml, and 107 E coli, 152 coliforms, 34 faecal streptococci, per 100 ml, respectively). Oocysts were also detected in adjacent to the fireclay pipe were positive for oocysts (0-13 oocyst/1 ml, respectively). Samples from the stream and soil and grass contamination (244 E coli, 403 coliforms, 58 faecal streptococci per 100 ml, and 107 E coli, 152 coliforms, 34 faecal streptococci, per 100 ml, respectively). Oocysts were also detected in samples of the treated supply in the absence of faecal bacterial indicators. Following the isolation, drainage and disinfection of the contaminated storage tanks, extensive mains flushing, and electrochemical studies. Proc Natl Acad Sci USA 1988; 85: 6331-44.

The waterborne route should be considered when clusters of cryptosporidiosis associated with potable water occur, even in the absence of bacterial or viral contamination.

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