Adrenal Gland Grafts Cause Psychosis in Parkinsonism Patients

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The adrenochrome hypothesis (Hoffer, Osmond and Smythies, 1954; Hoffer 1981, 1983,1985) — has been valuable in predicting clinical findings which had not been foreseen by investigators; they had not known or had ignored the hypothesis. The hypothesis was derived from three main lines of evidence:

(1) Adrenalin is oxidized to adrenochrome in vivo as well as in vitro. In myocardial tissue the major amount of adrenalin is changed into adrenochrome. Much less is so oxidized in other tissues. This is a specific example of a class of reactions. Catecholamines are easily oxidized into pigmented indoles: adrenalin into adrenochrome, noradrenaline into noradrenochrome, and dopamine into dopachrome. Further reduction yields a number of trihydroxy indoles of which adrenolutin from adrenochrome is an example.

(2) Adrenochrome and adrenolutin are hallucinogens (Hoffer and Osmond, 1967). It is highly likely noradrenochrome and dopachrome have similar properties because they are so similar in molecular structure.

(3) Compounds which reverse the effects of adrenochrome are therapeutic for schizophrenia and rapidly reverse the major effects of LSD: niacin and niacinamide are the best-known examples.

Following these findings it follows that increasing the quantity of these oxidized derivatives (chrome indoles) in the brain will cause psychotic reactions. This has been inadvertently done by asthmatic patients inhaling discoloured adrenalin. We did it with our adrenochrome experiments.

Two different sets of clinical experiments have now been reported, and again there was a major incidence of psychotic reactions. L-dopa came into use as a treatment for Parkinsonism. The short term results are therapeutic, but it does not halt the disease process and may accelerate it. Once I became aware that 1-dopa was being used, I concluded it would make some of these patients psychotic (Hoffer, 1970). I suggested there that dopachrome might be one of the schizophrenic toxins. Later, in an editorial note (Hoffer, 1970a), I reported the effect 1 -dopa had had on a schizophrenic patient. His parents described the results to me. It made him much more psychotic.

Yaryura-Tobias and Merlis (1970) reported that 2 1/2 percent to 55 1/2 percent of cases treated with 1 -dopa developed serious side effects. It aggravated neurotic and psychotic symptoms in schizophrenics and in Parkinsonism patients with no previous history of psychosis (Yaryura-Tobias, 1972).

Only Yaryura-Tobias and Merlis (1970) referred directly to the catecholamine involvement without mentioning adrenochrome when they wrote, "The catecholamine theory of schizophrenia and its relationship to the basal ganglia offers some good steps to unify part of the scattered research material of mental illness."

The role played by the chrome indoles from the catecholamines is ignored in the excellent review of Barbeau and McDowell (1970). Authors followed the fashion of ignoring one of the pathways used to destroy these amines in the body, probably because the word 'adrenochrome' was too dangerous to use. It was a non-word if one wanted respect from the psychiatric research establishment. Yet Campbell, True and Mandybur (1970) in this book found an enormous amount of extra neuronal melanin granules throughout the area of the locus coeruleus in one Parkinsonism patient who had been given 350 grams of 1-dopa over a period of eighty days. For comparison they examined twenty patients who had never been given 1-dopa. They

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reported that the only major difference was the "... unusual amount of extra neuronal melanin in substantia nigra." This is the red area of the brain, red because chrome indoles are reddish in colour. This is direct proof of the oxidation of 1-dopa via 1-dopamine to dopachrome. Albinos have the same reddish pigmented areas in brain, yet they can not oxidize tyrosine. It can only come from catecholamines to form neuromelanins.

Another type of experimentation is going on. Large quantities of noradrenalin and adrenalin are being forced into the brain by grafting adrenal tissue into the brain. This is being done to help patients with Parkinsonism. Autografts (patients' own adrenal medulla) have been grafted into the caudate nucleus. The tissue is placed into the head of the caudate nucleus, next to the lateral ventrical. There it is close to the vascular choroid plexus and is bathed in cerebral spinal fluid. It is then dispersed throughout the central nervous system (Pearce, 1988). This is similar to placing catecholamines by canula into the ventricals.

Fetal substantia nigra is also being transplanted into rats and into human subjects. So far major attention has been given to hoped-for therapeutic value of these grafts. The treatment was based upon the hypothesis that in Parkinsonism there is a deficit of dopamine. Only recently has the other side of the coin — toxicity — been discussed.

The adrenochrome hypothesis of schizophrenia suggests that placing large amounts of catecholamines in the brain, either by giving huge amounts of 1-dopa orally or by placing adrenal medulla grafts in the brain, will increase the production of psychotic reactions. This is now becoming a problem. Lewin (1988) abstracted these reports from a recent meeting of the American Academy of Neurology. Many patients experienced "... unusual and unexpected behavioural changes ..." immediately after surgery. These are much more striking than are changes which follow other brain surgery which is equally extensive. These changes fell into five categories:

1. Immediately after surgery they required much less analgesic.
2. Three days after surgery sleep patterns changed for three or four days.
3. Then they developed delusions. In one case a woman described herself as floating on a lake. Another patient was convinced that appliance salesmen were visiting patients, persuading them to buy things from which the hospital was getting a cut.
4. Some experienced personality changes including disinhibition and mania.
5. Several had visual and auditory hallucinations. None of these patients had experienced these symptoms before the operation.

These psychotic symptoms are similar to those produced by adrenochrome (Hoffer, 1962; Hoffer and Osmond, 1967).

One research group tried to correlate these behavioural changes with cerebrospinal fluid levels of catecholamines but found none. They did not measure chrome indole levels.

Flooding the brain with chrome indoles (1-dopa, for example) or their precursors like noradrenalin and adrenalin by using grafts, may have therapeutic value, but there is not doubt there is also a severe price: the side effects and toxicity. Another price will be an acceleration of the Parkinsonism process and decreasing survival. Since Vitamin B_3 acts as an antidote to adrenochrome, antagonizes the effect of LSD, another indole, and is therapeutic for schizophrenia, it could be used in conjunction with either 1-dopa or adrenal medullary grafts to prevent or decrease the toxic changes and permit their use for their beneficial value. Catecholamines may belong to a special group of chemicals which enhance the quality of life while hastening death. Niacin, to the contrary, extends longevity. This would be another valid indication for giving Parkinsonism victims Vitamin B_3.

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