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The Incidence of Malvaria

By P. O. O'REILLY, M. ERNEST and G. HUGHES

Preamble

Hoffer and Mahon (2), using an extraction method of their own, have shown that certain compounds, separated on paper chromatograms, give a mauve colour. This colour comes on slowly over 30 minutes as a pink area which slowly turns mauve and then within a half to 1 hour has a typical mauve appearance. It then begins to fade and usually, within several hours, has gone. The presence of this mauve colour is taken as a positive indication of the presence of these substances, and Hoffer and Mahon state that the majority of schizophrenics have these unknown substances in their urine.

O'Reilly *et al.* (5), using the Hoffer-Mahon technique, have shown the incidence of malvaria in 200 consecutive admissions to a psychiatric ward to be 44·5 per cent. In relationship to 44·5 per cent. of cases, it is to be noted that this finding cuts across all diagnostic categories and that there is a positive correlation between thought changes and malvaria, but not with other factors investigated. It was felt, however, that the incidence of malvaria in a general hospital population should be investigated. The term malvaria was coined by Hoffer and Osmond (3) to describe a diagnostic syndrome characterized by the finding of the mauve factor in the urine.

Setting

The Moose Jaw Union Hospital is a 254-bed general hospital which serves mainly 55,000 people of the Moose Jaw Health Region. However, it is a referral centre for south-western Saskatchewan, and quite a number of patients come from outlying districts. The hospital has a psychiatric department of 24 beds, the great majority of admissions being screened through the Mental Health Clinic. The patients, with all types of acute and recurrent mental illness, are admitted for investigation and treatment on the psychiatric ward.

Procedure

An early morning specimen of urine was obtained from every patient admitted to the surgical, paediatric and psychiatric wards, and from 49 children referred to the Mental Health Clinic. All urines were analysed blind. The procedure was as follows:

Early morning urine was adjusted to a pH of 6·7 and extracted three times with equal volumes of pure ether. The pooled ethereal extracts were dried with anhydrous sodium sulphate and filtered. The extract was then evaporated at room temperature and reduced pressure. The substances are very heat-labile and in earlier studies were destroyed after being heated to 40° C. in a water bath. The aqueous portion remaining was then extracted with pure chloroform. This was dried with anhydrous sodium sulphate and the chloroform solution was run on paper overnight in isopropanol-ammonia water. Next day the dried paper was sprayed with Ehrlich's reagent.

The mauve spot appeared at an Rf of 0·83. The colour developed slowly (over 30 minutes) as a pink area which turned mauve slowly and was finally typically mauve. It then began to fade and usually within 3 to 24 hours was gone.

A total of 850 patients' urines were analysed in the above manner.

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Results

Table

Category	Total Numbers	Number Positive	Percentage Positive
Normal adults ..	277	33	11·9
Normal children ..	134	16	11·9
Cancer patients ..	22	11	50
Disturbed children	49	12	24·5
Schizophrenia ..	86	45	52·3
Affective psychosis	127	60	47·24
Organic states ..	28	8	28·6
Personality disorders	37	10	27
Alcoholics	49	18	36·7
Psychoneuroses ..	41	13	31·7
	850	226	26·58

Definition of Normal

In this study, normal is defined as patients admitted to hospital for physical disease and not referred for psychiatric evaluation.

Cancer Patients

In examining the urines of 22 patients suffering from carcinoma of various types, 11 showed positive mauve factor. A random selection then of five from the mauve positive group and five from the mauve negative group were analysed, and the following results were obtained.

In both groups there were carcinomas of the advanced type, two cases in the positive group and one case in the negative group. All the other cases of carcinoma were in general localized, or possibly did involve local lymph nodes. These cases were all operable. Thus, there would appear to be no differences in the stage of cancer, giving rise to positive or negative malvaria tests.

Many of the patients were receiving multiple drugs. These included barbiturates, antibiotics and morphine derivatives used prior to anaesthesia. It is noted that in both groups there were patients who apparently received no drugs around the time the urine specimen was examined.

There appeared to be no relationship between surgery and whether the urine would be positive or otherwise.

Some patients received blood transfusion, but there appeared to be no relationship between this and the urine test.

Examination of the blood chemistry, haemoglobin and white blood counts of the two groups failed to establish any relationship between routine biochemical changes and whether cases would be mauve positive or negative.

On the basis of the analysis of these ten cases, there does not appear to be a clue or relationship between cancer patients mauve-positive and mauve-negative patients in respect to the urine test.

Psychiatric Cases

In relationship to the psychiatric cases, the first 200 consecutive admissions to the Psychiatric Ward were analysed and reported on. In assessing the results, the following findings were analysed: age, marital status, educational level, previous admissions, sex, perceptual changes, thought changes, depression, inappropriate mood and anxiety. This part of the study demonstrated that 44·5 per cent. of the 200 cases examined excreted a chemical in their urine which gave rise to what is called the mauve factor. On perusing the results it was found that the mauve factor occurs in all diagnostic categories and was not confined to schizophrenia. It does, however, appear more frequently in schizophrenics than in other groups, $P = <0{\cdot}05$ to $>0{\cdot}02$. There was a high correlation between thought changes and the mauve factor, $P = <0{\cdot}001$. Thought changes were defined as follows: Paranoid thinking, Blocking, Delusions, Flight of ideas, Tangential thinking, Clang associations, Constricted thought, Disordered thought, Bizarre associations and confusion. This trend was maintained in the 368 urines examined in this study. It was indicated by the findings that 41·8 per cent. of all psychiatric cases had a positive mauve factor and that the mauve factor was positive in 52·3 per cent. of schizophrenic cases.

Normal Children

In view of the fact that 11·9 per cent. of the children admitted to the paediatric ward were

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mauve positive, it was felt that some investigation should be done. A mauve-positive child was matched with a negative one as regards age and type of illness. The following investigations were carried out. A social worker visited the home of each child and obtained a complete social history on the child's background and assessed the level of anxiety in the home. As well as that, a complete school record of each child was obtained from the school system in relationship to his performance, I.Q., and social interaction. The child himself was not psychiatrically examined, as it was felt that this would be too threatening to the child and also to the family of the child concerned. Each group consisted of ten children. Summarizing the school record and history of each child, and the social background and assessment of parents, no significant difference was noted between the two groups.

Discussion

Hoffer and Osmond (3), in their studies, state that the mauve factor was not found in any normal subjects. The number they tested was just 13, and included physicians and nurses. The second category which Hoffer and Osmond designated as normal subjects undergoing stress, were those tested who were awaiting surgery, normal from a psychiatric viewpoint, or patients who have undergone major surgery, or who are gravely physically ill, having been physically stressed. They tested a total of 26 patients who were admitted to the surgical and medical wards of their hospital. None were mentally ill or under psychiatric treatment. They reported that the mauve factor was found in only one case, in a subject the morning after surgery. In our study, a total of 850 patients' urines were analysed, and included in this group were 277 normal adults under stress and 134 normal children under stress. Utilizing Drs. Hoffer and Osmond's criteria, we found that 11·9 per cent. in each group were mauve-positive. Members of the medical and nursing staff were examined and two out of the 19 (10·5 per cent.) were mauve-positive. Ten positive and ten negative normal children under stress were investigated and we found no significant difference between these two groups. We would therefore suggest that on the basis of these findings, the incidence of the mauve factor (malvaria) in the general population appears to be in the region of 11 per cent. These 11 per cent. at the present moment do not appear to be showing any psychiatric disability. Examining this now, in relationship to the psychiatric cases, we find the incidence of malvaria in all types of psychiatric cases to be 41·8 per cent and 24·5 per cent. in disturbed children. A further breakdown indicates that it is positive in 52·3 per cent. of schizophrenic cases. Therefore, the incidence of malvaria is much higher in emotionally disturbed children and adults than in the general population. A most interesting finding appears to be the high incidence of malvaria in cancer cases (50 per cent.). Is this positive finding due to the stress created in these people suffering from cancer, or is it due to the cancer process itself? From the selection examined there did not appear to be any correlation in relationship to the cancer process itself, and therefore the psychological implications will have to be carefully examined in order to see if a correlation exists here. The mauve factor itself is an unknown substance. As far as can be ascertained, there are four components involved. Irvine is convinced that they are pyrroles rather than indoles. Hoffer postulates that it is some non-toxic metabolite of some toxic substance which can be produced in the liver, kidney, gut, or some other metabolic system. Altschule (1) showed that 90 per cent. of his patients with hyperaminochromia were schizophrenic. It is therefore possible that some change in adrenochrome metabolism has led directly or indirectly to the production of malvaria. Haemoglobin catalyses the oxidation of adrenaline to adrenochrome and quickly alters adrenochrome to adrenolutin *in vitro*.

There is no doubt that malvaria exists, but what is its significance? Our results show that the incidence of malvaria rises with the severity of the disturbance, i.e. from 10·5 per cent. to 24 per cent. in disturbed children, 41·8 per cent. in psychiatric cases to 52·3 per cent. in schizophrenics. Does malvaria-positive (normal) indicate a latent psychotism? or just a reaction to stress by a specific group of individuals? Are we indeed dealing with a specific disease entity

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as predicated by Hoffer and Osmond? A detailed investigation of 200 of the psychiatric cases reported in this study shows a positive correlation between malvaria and thought disorder. However, it was found that the presence or absence of malvaria is not related to treatment outcome.

Taking all points, therefore, into consideration, the next essential step is the identification of the mauve factor itself. Further research must be carried out on the malvaria-positive cancer patients in order to elucidate its significance here. There is no doubt that the mauve factor is opening up a new field in psychiatric research which may lead to new insights.

Summary

Utilizing the Hoffer and Mahon technique, the incidence of malvaria in 850 admissions to a general hospital has been investigated. Malvaria occurs in 10·5 per cent. of normals, 11·9 per cent. of normals under stress, 11·9 per cent. of normal children under stress, 24·5 per cent. of disturbed children and 41·8 per cent. of all psychiatric cases. The incidence of malvaria appears to rise with the severity of the emotional disturbance, as indicated by the fact that the mauve factor was positive in 52·3 per cent. of cases clinically diagnosed as schizophrenia. Its occurrence in 50 per cent. of cases of carcinoma warrants further study. A discussion of the implications of these findings is presented.

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