Clinical and Biochemical Correlates of Hypomania in a Child

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There has been a great deal of controversy in the psychiatric literature about the existence of affective disorders in childhood. The concept of depression in childhood has in recent years gained wide acceptance, but mania as a clinical phenomenon in childhood has been described in only a few isolated case reports (Anthony and Scott, 1960; Barton-Hall, 1952; Beres and Alpert, 1940; Campbell, 1952; McHarg, 1954; Sadler, 1952; Spiel, 1972; Van Krevelen, 1962). Psychotic forms of affective disorders are surely almost non-existent in childhood; however, neurotic forms of both types of affective disorders may be far more prevalent than is generally recognized. Our previous publications indicate this to be true of depression (Cytryn and McKnew, 1972; McKnew and Cytryn, 1973).

The patient described in this report represents an example of a hypomanic state which had existed for at least one year prior to our investigation and continued during the study period of over three years. During this period, the child was hospitalized on a research ward for 10 days, during which time psychological observations and biochemical determinations of urinary metabolites were carried out. Subsequent to the hospitalization, the child was followed on an outpatient basis.

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Case Report

Tom was 8 years old when he sustained a severe electrical burn, which resulted in amputation of his left forearm and severe scar-ring of the upper half of his body. This scarring produced a grotesque appearance as well as limitation of movement. The accident occurred when a group of children were playing in a railroad yard, and several of the older children goaded Tom to climb onto one of the railroad cars with promises of finding money. He lost his balance and reached for the nearest object, which was a high-tension electrical wire. Following this accident, he spent a year on the surgical ward of Children's Hospital and underwent numerous procedures. Throughout this period, he exhibited a typical hypomanic picture. His mood was constantly euphoric; he was inappropriately jocular and frequently socially offensive. He was extremely restless, and expressed many grandiose ideas about his abilities, strength, and wealth, but never had a complete break with reality. At times, when frustrated, he exhibited brief attacks of rage, only to deny this behavior shortly thereafter. His hypomanic behavior increased at times of stress, such as before an operation, on having to leave the hospital, which he had come to view as his home, or on any attempt to reveal his scarred body. There were occasional brief episodes of depression, sadness, and psychomotor retardation, usually followed by an increase in the hypomanic activity.

Tom was born out-of-wedlock; at the time of his birth, his father was in jail for armed robbery. No complications were reported during pregnancy or delivery. During the first year of his life, he was cared for largely by the maternal grandmother because the mother had to work to support the family. When he was 2, his mother met Mr. W., and they married soon thereafter, moving away from the grandmother, who had up to that time been the central figure in Tom’s life. This was only one of the many object losses which were to occur in this child’s life. When Tom was 2½ years old, his mother had to enter the hospital for a prolonged illness, and he was placed in the care of his stepfather, who moved in with other relatives. He was badly abused by this family because he had been born out-of-wedlock. When the mother returned home and learned of the mistreatment of her child, she left her husband and returned with her son to stay with the maternal grandmother. During the next year, Tom occasionally saw his stepfather, who later died of Hodgkin’s disease when Tom was 4. When Tom was 7½, his mother met and married her current husband.

Our intensive contact with Tom started about one year after the
accident, when he was admitted to our research ward. During his stay there, he remained hypomanic and provoked several dramatic situations which were illustrative of this behavior. One day when the child saw the therapist, he started clowning, grinning, laughing, jumping around, hit the examiner in the stomach, and pretended that he was Zorro. When confronted with a nurse's complaints about his behavior, he became belligerent and began to shout, “Don't bother me! I am too busy, don't you see!” and proceeded to break up pieces of a puzzle, despite the fact that a nurse was trying to stop him. As his agitation increased, he jumped up on a chair and said, “I am Zorro myself, don't you see? I am a strong man, I am very strong.” Then he jumped down and began to dance like a Spaniard, singing a popular Spanish tune.

On another occasion, when the investigators arrived on the ward to make rounds, the boy walked by, pretending not to notice us. When the investigators greeted him, he came over, slapped one investigator’s back, and said, “Hi, stranger! Good-bye now, I don’t have time for you now.” He was persuaded to go into his room, and once in the room, suddenly jumped up and ran to hide under the bed, where he began to growl, “I am a lion, I am a very dangerous lion.” He then asked to lower the side of the bed so his “cage” could be closed, saying, “I am very dangerous, don’t come too close because I would eat your arm up.” Following this, he lay down on the floor and with his foot, raised the mattress above him. “You see how strong I am, I am raising the castle with one leg, I am Superman.” When the side of the bed was raised and he was asked to come out, he got up, slapped the investigator’s back again, and said, “I have got to go now, don’t bother me.” As he left, he called a pediatric resident by the name of Wood, “Hi, woodpecker,” and ran off, looking very busy.

Later, when Tom was to have a physical examination, he belligerently refused to undress. When helped by the nurse, he was very reluctant and uncooperative. When the nurse was finally able to remove his shirt, exposing his torso covered with very thick keloid scars, he became acutely agitated and refused to cooperate. When the investigator attempted to examine him with the stethoscope, Tom said that the investigator was a telephone operator. After a while, he took the stethoscope away from the doctor and attempted to listen to the doctor’s chest as well as that of the nurse. He said that he was a doctor himself, that we were his patients and were going to receive shots for being bad. When the doctor examined his chest, Tom leaped from the bed, ran to an open closet, and hid
himself, crouching, groaning, and singing, "You can't get me out, you can't get me." After a while, he came out of the closet screaming, "They are going to kill me, they are going to kill me," and his facial expression was panicky. He ran out of the room, half-naked, and was not caught by staff members until he reached the end of the hall. This behavior was repeated whenever we attempted to examine him.

One of the few episodes of depressive behavior occurred one day prior to plastic surgery. Tom was very subdued, had a sad facial expression, seemed preoccupied, and responded only in monosyllables. He answered questions seriously, although briefly, without the usual histrionics, and showed a mild psychomotor retardation, in striking contrast to his usual extreme hyperactivity.

Subsequent to the child's discharge from the research ward, he continued to be followed in weekly psychotherapy (2½ years as of this writing). Because of the high level of denial used by Tom, attempts to explore the transference or dynamics were not successful. However, he formed a meaningful relationship with the therapist, which enabled the latter to assist Tom in testing reality and being more responsible during his manic phases. During the depressive episodes, Tom was more responsive to exploring feelings and personal relationships. Chlorpromazine and dextroamphetamine were tried, with only transient benefit, and both drugs were discontinued after three months. There have been wide fluctuations in his affective state. The picture which has emerged indicates that times of family tranquillity are accompanied by a marked decrease of the hypomanic picture. However, since his hospitalization several traumatic episodes occurred in the child's family life, including the jailing of his new stepfather (a man with whom he had good rapport) for armed robbery, and a year later the hospitalization of his mother for an acute depressive episode. Each of these episodes was followed by long periods of typical hypomanic behavior, affect, and thinking, such as that which was noted during his hospital stay. As of this writing, Tom is beginning to face adolescence, and the hypomanic picture is gradually beginning to alternate with a typical picture of chronic depressive reaction. This reaction is precipitated by his concerns about poor peer acceptance, his physical appearance and attractiveness to girls in the face of increasing biological drives. In the past, such concerns were dealt with by denial; however, such denial under the impact of improved reality testing is no longer so readily available to the patient, and hence the continued emergence of the depressive picture.
Setting

Tom was admitted to the Clinical Research Center of the Children's Hospital, where he was seen twice daily by one of the investigators. Following the afternoon visits, a daily conference to review clinical impressions was held with the nursing staff. On the basis of these discussions, the child was rated on a nine-point scale for depression and mania. In addition to the global rating scale, extensive clinical notes were kept of the patient's behavior, verbalization, fantasies, and dreams.

Collection of Biochemical Data

During Tom's stay in the Clinical Research Center, the total urine was collected daily and processed at the end of each 24-hour period. The children were maintained on a low catecholamine and indolamine diet. No child had been on medication for at least two weeks prior to his admission to the hospital.

The metabolites studied were: norepinephrine, epinephrine, vanillylmandelic acid, homovanillic acid, 3-methoxy-4-hydroxyphenylethyl glycol, 17-hydroxycorticosteroids, and 5-hydroxyindolacetic acid.

Norepinephrine and epinephrine were determined using Bio-Rad catecholamine-by-column test kit, since high precision and satisfactory recovery (85-90%) have been claimed and verified independently (Sandhu and Freed, 1968). Vanillylmandelic acid was determined by sigma reagent kit method, which is a modification of the classical method of Sunderman et al. (1960). Homovanillic acid was determined, using the method of Goldberg and Friedland (1972). 5-hydroxyindolacetic acid was determined according to the procedure of Undenfriend et al. (1958). Creatinine was determined by modified Jaffe reaction (Henry, 1964). 3-methoxy-4-hydroxyphenylethyl glycol was determined by the DeKirmanjjan and Maas method (1970). 17-hydroxycorticosteroids were measured by the Glenn-Nelson method (Rosenthal and Mason, 1959). In all of the above experimental procedures, a pooled urine sample was included as a control with each run to test its validity.

Comparison Group

In our previous investigation, we had studied the 24-hour excretion of all the above biochemcals in 22 normal 10-year-old boys, comprising an entire class in a local school. Dietary precautions and...
biochemical methods were identical with those reported in this paper, and the assays were done in the same laboratory.

Results

During the patient's stay on the ward, his daily behavioral ratings as well as the general clinical impressions revealed him to be within the hypomanic range throughout. The mean biochemical values are contained in Table 1. Of these, the two most significant findings are an increased urinary excretion of 17-hydroxycorticosteroids and a decreased excretion of 3-methoxy-4-hydroxyphenylethyl glycol.

Discussion

The manic state in adults includes disturbances in three major areas: affectivity, stream of thought, and psychomotor activity. In Noyes and Kolb's textbook (1958), under affectivity are noted such items as excitement, noisy hilarity, unrestrained playfulness, mischievousness, ideas of grandeur, delusions of wealth and power, sarcasm, arrogance, and unbound aggressiveness. Under stream of thought are such items as loquaciousness, emphatic speech, flight of ideas, clang association, or illogical flow of ideas. Under psychomotor activity are listed such items as overactivity, singing, shouting, meddlesomeness, social inappropriateness, short attention span, and distractibility. During a period of four years of observation, our patient has consistently exhibited a majority of the features noted above, especially those listed under affectivity and psychomotor activity. Disorders of stream of thought have been present less frequently, but on occasion flight of ideas and clang associations have been noted.

In reviewing this child's past history, one is struck by the similarity of his background to that seen in many of our children with chronic depressive reaction. There have been frequent object losses starting in the first years of life, ambivalence and covert rejection on the part of important figures throughout the child's life, and a brief episode of outright rejection and physical abuse. In contrast to many children with similar backgrounds who respond with a depressive reaction, this child, prior to the accident, had a history of playful rambunctiousness, aggressive and counterphobic behavior. Following the accident, he displayed the hypomanic behavior that we have described. During the follow-up period, the same pattern of loss followed by hypomanic behavior has continued, and
Table 1

24-HOUR MEAN VALUES FOR CONTROLS AND PATIENT EXPRESSED AS CONCENTRATION PER SQUARE METER OF BODY SURFACE ± STANDARD ERROR OF THE MEAN

<table>
<thead>
<tr>
<th>CLINICAL DIAGNOSIS</th>
<th>SUBJECTS</th>
<th>ngNE</th>
<th>ngEPI</th>
<th>ugVMA</th>
<th>ugHVA</th>
<th>ngMHPG</th>
<th>ugl7-OHCS</th>
<th>ng5-HIAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTROLS (N=20)</td>
<td></td>
<td>23.1±1.4</td>
<td>5.0±0.5</td>
<td>3.3±0.2</td>
<td>2.62±0.26</td>
<td>1092±109</td>
<td>1.50±0.12</td>
<td>665±56</td>
</tr>
<tr>
<td>MANIC J.W. (N=4)</td>
<td></td>
<td>25.6±0.8</td>
<td>5.2±0.6</td>
<td>2.8±0.1</td>
<td>2.33±0.10</td>
<td>463±49 †</td>
<td>2.09±23 †</td>
<td>648±35</td>
</tr>
</tbody>
</table>

* p < 0.05
† p < 0.01
‡ = p < 0.001
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only recently has a more customary depressive picture begun to show through the still predominantly hypomanic background.

Very little is known about the child's natural father. During the child's growing-up period, the mother used denial predominantly as a way of handling most traumatic and stressful situations, much as the child did at that point in his development. Even at the time of the accident, she continued to remain calm and passive, denying the gravity of the situation. Only during the past year has the mother been able to experience a depressive response to life circumstances, and during one such episode, she had to be hospitalized, as noted earlier.

Throughout his life, the patient's main defensive maneuver has usually been massive denial. His denial has been so extensive that it has been penetrated only by a few unusual circumstances, such as disrobing his deformed body or subjecting him to the ridicule of his peers, at which times his underlying helplessness and despair have shown through. The boy's denial has often been accompanied by projective mechanisms, which at times have produced a paranoid picture evident in ideas that people are going to harm him or are out to get him. The most probable explanation of the patient's choice of the mechanism of denial to defend himself against the underlying despair is identification with his mother's mode of defense, although other factors such as age, culture, and constitutional predisposition no doubt play a part.

Although at times the boy's thinking is quite grandiose, there has never been a complete break with reality to indicate a psychotic disorder. He has had no hallucinations or delusions. His interpersonal relations are often inappropriate, though there is genuine warmth toward certain important people in his life.

The issue of anxiety is an important one in such cases. There is no doubt that during the episodes described in the clinical vignettes, he was frequently markedly anxious. However, his anxiety was most clearly evident at times when his hypomanic defenses were breaking down; at times when they were functioning the best, he seemed to show little, if any, anxiety. He often exhibited such features of minimal brain dysfunction as restlessness, short attention span, and distractibility. However, in a group of 100 children with minimal brain dysfunction recently studied at our hospital, the grandiose thinking, excessive jocularity, and persistent euphoria characteristic of this boy were not noted (Greenberg, 1972). Neurological examination of this patient has not revealed any evidence of neurological impairment.

We feel that the most significant findings in the study of this
child relate to the clinical description and the dynamic and diagnostic considerations noted already in the discussion. However, in closing, we would like to comment on the biochemical findings, namely, an increased excretion of 17-hydroxycorticosteroids and a decreased excretion of 3-methoxy-4-hydroxyphenylethyl glycol. Interestingly, both of these findings run counter to the findings in manic adults (Bunney et al., 1965; Schildkraut, 1972). Of course, it should be remembered that our findings relate to only one case.

**Summary**

A case of hypomania in a latency child has been described. The patient has been studied extensively, both from the psychological and biochemical point of view.

The hypomanic features are present in the areas of activity level, thought process, and mood. The most characteristic clinical findings are grandiosity, excessive familiarity, jocularity, and frequent socially offensive and angry behavior. The differential diagnostic considerations included childhood psychosis, anxiety reaction, and minimal brain dysfunction.

The urinary metabolites studies included: norepinephrine, epinephrine, vanillylmandelic acid, homovanillic acid, 3-methoxy-4-hydroxyphenylethyl glycol, 17-hydroxycorticosteroids, and 5-hydroxyindolacetic acid. The most significant biochemical findings were an increased urinary excretion of 17-hydroxycorticosteroids, and a decreased excretion of 3-methoxy-4-hydroxyphenylethyl glycol.

**References**


Greenberg, L. (1972), Personal communication.
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