

# Impaired Cognition — A Ubiquitous Finding in Psychiatric Disorders

W. M. Bowerman, M.D.<sup>1</sup>

"Beauty is in the eye of the beholder", it is said, and I learned years ago that medical and psychiatric histories are just as much in the mind of the examiner as in the life of the patient. For years I tried in vain to get patients to give coherent accounts of their illnesses that would clarify the onset and course of them, and what effects on that course were made by remedial measures that they had undertaken. In psychiatric training these historical difficulties seemed more pronounced and I often felt frustrated trying to get a grasp of a patient's emotional difficulties. In this form of practice it is so important to see the world through the eyes of the patient. Initially I thought that shame, humiliation, and despair result in a certain amount of conscious withholding of information and that repression was responsible for unconscious withholding. No one had ever taught me that poor memory, minimal confusion, and difficulty with time sequencing could commonly be a basis for poor historical information. It was only in those rare cases of Organic Brain Syndrome that these symptoms were supposed to occur. As a resident I was fortunate to have

available extensive psychological services so that patients suffering with organicity could be examined for it. However, my expectation of having a definitive diagnosis by this type of examination was doomed to frustration (Benson and Blumer, 1975). It seemed that frequently the issue was a distinction between Schizophrenia and Organic Brain Syndrome. Perhaps the first patient that brought this to my attention was a college girl in graduate school with well documented schizophrenic episodes, who used to talk about her problems with uneven flat surfaces and room corners that were not 90 degrees.

One day, while going through stacks of the Bulletin of the Menninger Clinic, I came across an article by Mayman and Gardner (1960), describing patients who said that they had problems with memory but who on psychological examination did not demonstrate any signs of organicity, particularly those signs originally described by Goldstein and Sheerer (1941). Having pondered that subject for 14 years now, I have come to the conclusion that cognitive impairment and some perceptual distortion is fundamental to many if not all of the psychiatric syndromes, and it is best discovered simply by discussing it with the patient. In her recent book, **Neuropsychological Assessment**, Dr. Lezak says, "The reality of memory complaints is not always

<sup>1</sup>4350 S. W. Cedar Hills Blvd., Beaverton, Oregon 97005.

apparent, even on careful (psychological) examination (Lezak, 1976).

One reason for the difficulty in getting historical data on perceptual and cognitive changes is that patients have suffered it for years, have told it to many doctors, and these descriptions have been ignored. It is surprising how many young patients will describe that their memory has been worsening over a period of several months or several years. It's rather common in a traumatic neurosis to get a history that patients have difficulty with memory. They also have problems with spatial orientation and one patient gave up golf because he no longer could estimate the distance in driving the ball off the tee. A frequent source of discomfort to such patients is the driving on busy freeways where they have difficulty tracing the moving objects going in different directions, and these patients will often take side roads to avoid that discomfort, or will even stop driving. Reading with comprehension is another source of difficulty for such patients and they will often recognize their difficulties in this area. A patient who is a salesman for a business machine company would go to the chief repairman and ask him for descriptions of some of the equipment that he was selling because he was not able to absorb information from reading technical literature. Another patient got fired every time he got promoted from manual labor to supervisory work because he had to deal with written information.

Another issue that makes historical information about perceptual and cognitive defects difficult is that these wax and wane. At one time I worked with a patient for three or four months trying to convince him that he had this difficulty and he refused to accept it as a basis for his inability to work. However, in checking with his friends on the Little League Committee of which he was chairman, they told him that his ability to function as chairman was quite variable and then he began to realize that even in doing ordinary household tasks his ability to cope with them fluctuated from time to time. The strange appearances of lights, a shift in the perception of color, distortions in bodily

feelings, placing events in time sequences, noting parallel events happening to those things central to some other activity such as noting what is going on around one as one makes a trip, or conversations that one has with a passenger on a trip are often indications of trouble with cognition.

There are elements which at times appear to be borderline aphasic. Some patients have distinct difficulties with the use of nouns even though on formal aphasic testing they are able to give the name of objects that are presented. In listening to such patients, one often gets the impression that they are describing events in some detail simply because they cannot give it a category by name. Borderline apraxias are sometimes seen, where patients are unable to perform tasks that they have done well for many years. This is not a common finding but on careful investigation one can find that the patients are having more difficulty with routine tasks than they ought to have for their abilities and age and level of adjustment.

It appeared clear to me that most psychiatric patients, whether or not they seem to have an Organic Brain Syndrome, are unable to provide the proper amount of detail about their life experiences and in particular have trouble placing events in time. One recently retired gentleman was examined for depression following a minor automobile accident. On taking the history, it was absolutely impossible to learn whether or not a farm that he had worked for forty years and from which he had just recently retired had been disposed of before or after the automobile accident. There was no other sign of memory difficulty with this gentleman.

During the years when the value of the examination for cognitive and perceptual disorders was unfolding, I was also doing some glucose tolerance testing. In the beginning it seemed that for the psychiatric patient it was too artificial to introduce a period of three days of high carbohydrate intake before the test. After all, what we are interested in for our patients is what kind of symptoms they are experiencing in the life condition that they live day by day. We are not as much interested in whether any test is

scientifically reproducible. Due to the fact that the testing was done in a laboratory where I had considerable social contact, I learned that my patients had different reactions to the five hour glucose tolerance test than those of my non-psychiatric colleagues. Having learned that I could not expect detailed information from psychiatric patients, I decided to visit with them frequently during the testing process. It was amazing to see patients so ill during the test that they could not sit up, to note shifts in thermal regulation as evidenced by complaints of being warm at one time and chilling at another. On careful questioning, many of the patients had lightheadedness or faintness on standing during the test. Some became ataxic, others developed difficulty concentrating or fuzziness of vision, some had periodic motor restlessness and anxiety alternating with apathy and depression. The fluctuating level of their adjustment from hour to hour was striking, but equally striking was the fact that the patients themselves did not recognize a change in their level of adjustment during the course of the testing. This phenomenon of shifting symptoms and level of adjustment from one part of the day to another is equally true in regard to their basic symptomatology and it is also noteworthy that the patients are not aware of this. Patients are very prone to rationalize inability to function. One way in which this is noted during the clinical examination is that in the process of giving a description of symptoms what the patient begins to do is to explain why symptoms are occurring, and by that maneuver to avoid explaining just what is occurring.

The duration of symptoms provoked by glucose tolerance testing is also surprising. Although on a follow-up visit a patient may deny that symptoms persisted later in the day or to subsequent days, if they will keep a diary or bring another person with them one may find out very clearly that symptoms persisted quite a period of time. If one also takes an hour by hour history of what they do following the testing it is evident that for a day or two they are not functioning as well after the glucose tolerance test as they were before, even though they were symptomatic

before the test. Some patients have had to go to bed for two or three days; one patient was in bed for a week simply by reason of dizziness, weakness, and some mental confusion. The glucose tolerance test can provoke psychosis and I have seen a patient twice become homicidal during the three days of high carbohydrate intake prior to glucose tolerance testing in another office. One patient is presently suffering from a smoldering psychosis that was precipitated by a glucose tolerance test three years ago and for which he was hospitalized one week immediately following it.

In personally observing patients during glucose tolerance testing and during their subsequent treatment it is evident that the numerical values derived from the testing are not in themselves indicative of any relationship between carbohydrate metabolism and their symptoms (Ross, 1974). What is indicative is the kind of symptoms and the degree of symptomatology which they have during the course of the testing. In general, one can say that the sicker the patient gets during the course of the testing, the more rapidly the person will respond simply to a low carbohydrate diet. The symptoms that the patient develops during the glucose tolerance testing are not necessarily those of which they are complaining, and the general level of illness occurring and following the test is the best indication that a low carbohydrate diet is of value.

It is also of note that symptoms occurring during the glucose tolerance testing are different from patient to patient and do not seem to be related to the psychiatric diagnosis. At first glance this seems surprising, but there is a confirmation from other situations. Dr. Bernard Weiss in his testimony before the Select Committee on Nutrition and Human Needs of the United States Senate on metal toxicity and mental symptoms says, "In table one I have compiled some of the neurological, behavioral, and subjective accompaniments of metal poisoning. These include loss of appetite, dizziness, lethargy, restlessness, depression, neurologic signs as numbness, tremor, and blurred vision. Note (referring to the table listing the symptoms of intoxicants from

twelve metals) how many of these symptoms reflect a non-specific character" (Weiss, 1977).

It began to appear that many psychiatric patients had subtle difficulties with perception and cognition and that these same patients had unusual symptoms during the glucose tolerance testing. The evidence in rats showing changes in brain serotonin with changes in blood sugar and insulin (Fernstrom, 1974), tended to give credence to the possibility of existence of subtle organic brain syndromes in many psychiatric patients and in all diagnostic psychiatric categories.

In this office the term "hypoglycemia" is used only as a laboratory term to indicate a patient who has had an examination and has been found to have a blood sugar below 50 mgm percent at some point. A term "carbohydrate intolerance" is used to indicate that it is suspected that the patient will respond to a lowering of carbohydrate intake. This term works out well during the treatment process because the symptoms are often reactivated by simply ingesting an increased amount of carbohydrate. This is not entirely accurate since other things such as stress, caffeine, and alcohol are common offenders in reactivating symptoms. Symptomatic reactions following such deviations from the dietary program may not be immediate and may not occur until the following day.

Having information that subtle organicity may appear in all psychiatric diagnostic categories, patients with such findings frequently are given a glucose tolerance test. It became standard practice in any psychiatric examination to look for Cognitive-perceptual problems and if they were present to do a five hour glucose tolerance test. When the patient showed demonstrable symptoms during this time a low carbohydrate diet was prescribed along with any indicated chemotherapy and/or psychotherapy. Naturally, such an investigation has led to evaluations of a few patients for pancreatic adenomas and other disturbances but none of these to date have

been found. One case of Sheehan's Syndrome was identified over this 14 year period.

Experience has shown that the expense of treatment was reduced to the patient population when the above approach was used. This is to say nothing of the fact that patients' suffering was reduced both in intensity and duration. Also, it became evident after some time of treating in this way that patients were improved by chemotherapy and/or psychotherapy but they often did not become well, whereas using a more Orthomolecular approach patients became well and sometimes felt better than they had previously for many years or maybe ever during their life. Recurrences of symptoms after treatment could often be traced either to increase in general stress or dietary indiscretions, and symbolic stress, fundamental to psychotherapy, seemed to play a lesser part.

Exploring the limits of this type of treatment, its pitfalls and dangers came next. Initially this course of treatment was used only in neurosis. It became apparent that depressive patients over 40 who had cognitive and perceptual disorders (Benson and Blumer, 1975) and abnormal glucose tolerance tests did not respond well to lowering their level of carbohydrate intake. More conventional types of treatment then were used in this group of patients, but in some cases further historical information obtained during the course of treatment resulted in a decision to add a low carbohydrate diet to the standard Orthomolecular approach. At this later time such a treatment program in some cases was beneficial whereas the initial phase of treatment it was not.

The next investigation was done in the state prison. Immediately in doing psychotherapy in a prison the question about memory comes up among the individuals because they complain about it so much. The standard teaching about memory among inmates is that they have a memory deficit which they feign, to avoid the problems of guilt about their crime. After careful investigation it was quite evident that this concept is floridly false (Kramer, 1977). These men have a great many problems with all kinds of cognitive and perceptual disorders. One inmate, who had been a

former business executive with no history of antisocial behavior, was convicted and had long sentences for five rapes which had occurred in the space of about two months. During the course of psychotherapy it required two years for him to remember an automobile accident which occurred prior to the time of these rapes. After the accident, which was not a serious one, his general social and vocational adjustment deteriorated until the time the rapes occurred and he was caught and incarcerated. Glucose tolerance testing in the prison was done over a period of five years. Among these men the degree of hypoglycemia is quite striking as is the magnitude of the symptoms they develop. One valuable aspect of the prison is that a man is under almost constant surveillance 24 hours a day and it is possible to determine a person's symptomatic status and level of adjustment better in a prison than out on the streets. In general, the symptomatic response to the test was more severe than patients in private practice. Over a five year period the use of chemotherapy among these men dwindled to almost nothing in favor of a low carbohydrate diet, between meal feedings, and a multi-vitamin daily. Compared to a long history of rejection of psychotropic drugs by inmates in that institution, acceptance of this program by the patient was almost universal (D'Asaro, 1975; Rojas, 1941; Rodale, 1968; Schauss, 1978).

Having had the experience with neurosis in general and antisocial characters with this kind of diagnostic and treatment program, it was decided to investigate the field of manic-depressive psychosis because there were sufficient patients available. Although such patients do have cognitive and perceptual disorders and do have abnormal glucose tolerance tests, neither the manic phase nor the depressive phase seems to respond beneficially to adding dietary control and vitamin therapy to the regimen. This seems to be true at any age.

Because of the fact that many, if not a large proportion, of prison inmates can be classified as having Minimal Brain Dysfunction and since it was found that Ritalin in rather large

doses was much superior to any neuroleptic drug in the treatment of excited homicidal inmates it was decided to explore clinically with children (Carpenter, 1972; Cott, 1977) their problems with cognition and perception and to use the glucose tolerance test as described above and low carbohydrate diets and vitamins with the Minimal Brain Dysfunction Syndrome. As others have found, it works very well and has much to commend it over the use of other drugs. Quite regularly, teachers and mothers can tell within an hour or so after a child has eaten a candy bar because of the change in his behavior. It appears, however, that hyperactivity, as such, has improved more by the use of low carbohydrate diets and vitamins than have other areas of the disorder such as dyslexia and underachieving in general.

Knowledge that Minimal Brain Dysfunction occurs in children and adults (Wood, Reimherr, Wender, and Johnson, 1976) has led to much information on pathological interaction in families. It seems quite likely on the basis of clinical information that carbohydrate intolerance and minimal brain dysfunctions are inherited disorders and quite commonly occur both in parents and children in a family. It's not uncommon also to find aunts and uncles or grandparents with the same syndrome. Perhaps much of the family disruption that can be seen beginning with Halloween and through New Year's can, in part, be related to the dietary changes that occur during this time and it is often wise to investigate these dietary changes when disruptions in family relationships begin to appear in this period. Summertime is another time when picnics, etc. lead to dietary changes and periods of psychiatric symptomatology. Hyperactive children are very destructive to relationships of all kinds, such as relationship between husband and wife, between family and the family next door, and between the families and the schools and other institutions. The divorce rate among families where there is a hyperactive child is very high. It is surprising sometimes in observing a parent with Minimal Brain Dysfunction who is being treated with a low carbohydrate diet to see one or two children in the family suddenly

begin to make a better adjustment simply because they have been put on this diet by the mother who refuses to cook high carbohydrate foods for the family when she is on this kind of diet. One can also see the deterioration in family relationships when candy is introduced to the family by a well-meaning friend or relative.

One lady made her entrance to the office by complaining that she was under indictment for having stolen some clothing out of a dryer in a laundromat. This entree was necessitated by the fact that she was on the verge of killing her five year old boy. He was a hyperactive boy who set fires and stole and created general havoc in her home as these children do, and his care with psychotherapy had done nothing to ameliorate the situation. After examination of the mother it was recommended that she be placed on a low carbohydrate diet with multivitamins and that the boy be placed on Mellaril, 10 milligrams three times a day. The response with the boy was immediate and satisfactory and continued to lend some peace and tranquility to the home as well as some happiness between the parents and the boy. Suddenly this boy was requiring Mellaril 75 milligrams a day and even at that he was not kept in good control. On investigation it was found out that the visiting grandfather thought it was a shame that his grandson was not getting candy so he was giving it to him.

The field of traumatic neurosis is a poorly defined one and even the term is an unofficial one. There are people who after accidents have free floating anxiety, phobias and depression (Thompson, 1965). There are others who sustain various kinds of injuries and when their injuries "heal they are left with irritability, neurasthenia, and depression, and may be incapacitated for life, as well as being quite uncomfortable and impossible to live with. These patients are also characterized by the fact that their degree of symptomatology and disability is far greater one year after the injury than it is a week after it.

In taking longitudinal histories with patients and taking particular pains to follow perceptual and cognitive dysfunction, it was

often apparent that the onset of the symptoms were really related to some kind of injury or accident, maybe years prior to the time when they thought they became ill. Many times, years after an accident the residuals are found only as some irritability, some anxiety or phobia, and some depression which leads one to think that one is dealing with just an ordinary psychogenic neurosis. In examining those with symptoms of traumatic neurosis and doing glucose tolerance testing it is evident that a high proportion of them are abnormal in that they respond with rather marked symptoms to that examination. The clinical experience has been that they respond much better to a more Orthomolecular approach with low carbohydrate diets, vitamins, and trace nutrients than they do to the exclusive use of psychotherapy and psychotropic drugs. Patients have been treated with this syndrome up to ten years after the incident or to a total disability and have shown a rather surprising amount of improvement after nine to twelve months of Orthomolecular treatment.

So far in this paper practically no reference has been made to affective states in either the diagnosis or the following up treatment of patients. For the purpose of this paper the emphasis needed to be on cognitive and perceptual changes and these are more easily presented. Changes in affective states are very useful in the diagnosis and following of such patients but their discussion requires a further paper.

### Conclusion

In almost all psychiatric diagnostic categories, but not necessarily all psychiatric patients, it has been found that pronounced cognitive and perceptual dysfunction can be identified and that these findings are similar in psychotic, neurotic and character behavior disordered patients. It is true that schizophrenia does present very pronounced changes in content and form of thought (Hoffer and Osmond, 1979), but changes in cognition and perception common to neurotic and character disorders can be found in schizophrenia. As schizophrenic

patients recover on Orthomolecular treatment they become exactly like neurotic patients in the type of symptoms, the ego alien character of symptoms, and their insight. In reality, in all psychiatric syndromes with the exception perhaps of mental retardation and childhood autism one may find cognitive perceptual changes sufficient for diagnosis of Chronic Brain Syndrome. This kind of investigation has been done clinically, and the glucose tolerance test has been used in all categories with the exception of the manic-depressive psychosis. There has been less than satisfactory responses in many cases of depressions beginning over the age of 40. Not only has there been relief of the psychiatric symptoms but also of those somatic concomitants of the psychiatric disorders.

The experiences described above have led to some theorizing about psychiatric disorders in general. It seems that many patients have a basic metabolic disorder that responds to stressful situations, either symbolic or physical, with prominent psychiatric symptoms. The waxing and waning of these symptoms are just as likely to be related to physical demands and dietary changes as to symbolic events. Attention to the effects of physical stress in addition to the symbolic stress makes a longitudinal history more accurate and interpretable. Careful inquiry into cognitive and perceptual dysfunction (Hamilton, 1967) requires skill and tact because patients are very defensive in regard to these symptoms but their presence in almost all psychiatric disorders can be found. Using the presence of these symptoms as a reason for doing the glucose tolerance test seems warranted. The reaction to the glucose tolerance test in terms of the patient's symptoms is a valid indicator of the value of a low carbohydrate diet as a part of the treatment. The use of vitamins and trace minerals and other nutritional elements is of value in their place. Although cerebral allergy has not been discussed here, whenever pronounced cognitive or perceptual disorders are found, the question of food allergy comes up at some time during the course of the

treatment.

Psychomotor seizure states, narcolepsy, and hysteria have very similar cognitive and perceptual problems as have been noted above. Discriminating among these three is important in terms of following the patients and the appropriate treatment at any particular time. In psychomotor epilepsy, the seizure state may not be identifiable until after an Orthomolecular treatment has been instituted. The use of the gustatory prelude to psychomotor seizures, although a valuable sign, is not necessary to the diagnosis. Narcolepsy (Szatmari and Hache, 1962; Dement et al., 1973) is a fascinating subject and many psychiatric patients will have, or develop in the course of treatment, some of the narcoleptic syndrome. Although it has been defined as a syndrome of daytime sleepiness, cataplexy, hypnagogic hallucinations, and sleep paralysis, insomnia is frequent in narcoleptics as is automatic behavior. Narcolepsy is worsened by a high carbohydrate diet and if a patient has been under treatment for depression, the removal of the antidepressant may result in the emergence of narcoleptic symptoms.

## REFERENCES

- BENSON, F. and BLUMER, D.: *Psychiatric Aspects of Neurological Disease*. Grune and Stratton, 1975.
- CARPENTER, R.: *Thanks Doctor*. 179 ff, RDC Publishers, 1972.
- COTT, A.: *The Orthomolecular Approach to Learning Disabilities*. Academic Therapy Publications, 1977.
- D'ASARO, B.: *Diet-Vitamin Program for Jail Inmates*. *Orthomolecular Psychiatry* 4:212-222, 1975.
- DEMENT, W., KALES, A., KALES, J., KARACAN, I., MITLER, M., WILLIAMS, R.: *Sleep Research and Clinical Practice*, 26-34, Brunner/Mazel, 1973.
- FERNSTROM, J.: *Nutrition and the Brain*. *Scientific American*, Vol. 230: 84-91, Feb., 1974.
- GOLDSTEIN, K. and SCHEERER, M.: *Abstract and Concrete Behavior: An Experimental Study with Special Tests*. *Psychol. Monogr.* 53: No. 2, 1941.
- HAMILTON, M. (editor): *Fish's Clinical Psychopathology*. Bristol: John Wright and Sons, Ltd, 1974.
- HOFFER, A. and OSMOND, H.: *How to Live With Schizophrenia*. Citadel Press, Secaucus, N.J., 1979.
- KRAMER, B.: *Problems of Learning Disabled Delinquents Persist into Adulthood*. *Clinical Psychiatry News* 5:26, Sept. 1977.
- LEZAK, M.: *Neurophysiological Assessment*. 160, Oxford University Press, 1976.

**ORTHOMOLECULAR PSYCHIATRY,  
VOLUME 8**

MAYMAN, M. and GARDNER, R.: The Characteristic Psychological Disturbance in Some Cases of Brain Damage with Mild Deficit. *Bulletin of Menninger Clinic* 24:26, Jan. 1960.

RODALE, J. I.: *Natural Health, Sugar and the Criminal Mind*. Pyramid Books, New York, 1971.

ROJAS, N.: Hipoglucemia en Delincuentes. *Sociedad de Medicina Legal y Toxicología*, 1941 (Spanish).

ROSS, H.: Hypoglycemia, *Orthomolecular Psychiatry* 3,4,240,1974.

SCHAUSS, A.: *Orthomolecular Treatment of Criminal Offenders*. Copyright Michael Lesser, M.D. 1978.

SZATMARI, A. and HACHE, I.: Narcolepsy - Clinical, Electrophysiological Appraisal. *Clin. Neurophysiol.* 14:586-587,1962.

THOMPSON, G.: Post Traumatic Neurosis - A Statistical Survey. *Am. J. Psy.* 1043-1048, May, 1965.

WEISS, B.: Hearing Before the Select Committee on Nutrition and Human Needs of the United States Senate. June 22,1977.

WOOD, D., REIMHERR, F., WENDER, P., JOHNSON, 6.: Diagnosis and Treatment of Minimal Brain Dysfunction in Adults. *Arch. Gen. Psy.* 33: 1453-1460, Dec. 1976.