The Relationship Between Candidiasis and the Hypersensitivities of the Gifted and Talented

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Abstract

The relationship between the hypersensitive nervous system of the gifted and talented and these individuals' sensitivity to the yeast organism, Candida albicans, was investigated. A thorough review of the published literature pertaining to the hypersensitive nervous system of the gifted and to candidiasis was undertaken. Parents and educators were alerted to the effects of candidiasis on the gifted individual's mental, emotional, and physical health. Further research on the susceptibility of the gifted to candidiasis was recommended.

The unique cognitive, affective, physical, intuitive, and societal characteristics of gifted and talented individuals (Clark, 1983) may produce hypersensitivity to surrounding stimuli. Over the past twenty years, a growing body of evidence has accumulated implicating the yeast organism, *Candida albicans,* as a source of chronic, debilitating symptoms (Truss, 1983). It is the objective of this research review to suggest and explore a possible link between the hypersensitive nervous system of the gifted and talented and these individuals' sensitivity to the opportunistic agent, *Candida albicans.*

After extensive investigation and observation of the gifted, M. Prentice (personal communication, October 17, 1985) has concluded that hypersensitivity is the one characteristic that all gifted individuals have in common. The findings of several other researchers corroborate her conclusion. Whitmore (1980) discusses in detail the keen sensitivities of the gifted to feelings of inferiority, inadequacy, and perfectionism. She views under achievement as a possible outcome of these feelings. VanTassel-Baska (1983, p. 42) suggests that the gifted must "learn ways of coping with their highly sensitive natures." Her concern is that the gifted acquire methods of channeling this sensitivity through school counseling strategies.

MacKinnon (1981), in reviewing the nature of creative talent, describes the creative person as one who is intuitive and perceptive in his or her openness to experience. MacKinnon further describes a "psychic turbulence" which is characteristic of the creative person and is a result of the "large quantities of tension produced in them by the richness of their experience and the strong opposites of their nature" (p. 126). His description of "psychic turbulence" would surely encompass "hypersensitivity." Cruickshank (cited in Whitmore, 1980) agrees that high creativity may cause nervous tension and that the supersensitive nervous system of the gifted contributes to inner conflict.

Other authors have dealt with the problems resulting from this inner conflict due to supersensitivity. Galbraith (1983, 1984) has written two books for gifted students which explore these problems in depth. She offers many concrete solutions to the issues created by hypersensitivity. Webb, Meckstroth, and Tolan (1982, p. 18) graphically describe gifted children as "emotionally intense with extra emotional antennae." Certainly, this descriptive phrase well depicts the meaning of hypersensitivity. In her recent study of gifted girls, Kerr (1985, p. 93) postulates that gifted girls "may be more sensitive than other girls are and more sensitive than gifted boys — especially to disappointments." This sensitivity may be expressed in "irrational or frequent worries and fears, upsetting nightmares, or easily hurt feelings" (p.93).

Schmitz and Galbraith (1985) further analyze the emotional dimensions of giftedness. These authors view the gifted as "being, by nature, highly perceptive, highly involved, supersensitive, and perfectionistic" (p. 23). They perceive the gifted to be "pro-

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foundly sensitive to small differences" and "highly perceptive to stimuli (to sounds, sights, movements, words, patterns, numbers, physical phenomena, or people)" (p. 23). Gifted individuals may display high involvement by being obsessed with beauty that surrounds them or with problems that confound them. This sensitivity may also refer to acute moral or emotional consciousness. Schmitz and Galbraith concur with Whitmore (1980) that sensitivity is also expressed as perfectionism due to the gifted person's highly attuned ability to discriminate between the mediocre and the superior. Being instinctively aware of this difference, the gifted individual will tend to pursue excellence.

Clark (1983), as mentioned previously in the introduction, believes that the gifted are hypersensitive to their environment because of their differentiating characteristics in five areas: cognitive, affective, physical, intuitive, and societal. In fact, her definition of intelligence as "total and integrated brain functioning, which includes cognition, emotion, intuition, and physical sensing" (p.6) is based on biological differences that affect the gifted individual's ability to perceive through his or her hypersensitivity. According to Wittrock (cited in Clark, 1983, p.6), the gifted have been found to have "at least three areas of advanced or increased brain growth: the growth of dendritic spines, increases in the complexity of networks of synaptic connections among neurons, and the division of neuroglial cells." Therefore, giftedness is a "biologically rooted concept" based on recent evidence of "advanced or accelerated development of brain function" (p.6).

Rosenzweig (cited in Clark, 1983, p.20) describes the glial cells that surround the neurons and maintains that the glia can be increased by stimulation from the environment. The glial cells "provide the brain with nourishment, consume waste products, and serve as packing material actually gluing the brain together" (p.20). The glial cells also serve as insulating material for the nerve cell, creating myelin which aids in conducting messages from the neuron at an accelerated rate. Thus, as glial cells are increased in the brain, the speed of learning is enhanced. Evidence suggests that this rate of glial cell production is influenced by the "richness" of the environment (p.21). Clark concludes that the more glial cells there are in the brain, the faster and more complex will be the thinking patterns. The neurons become biochemically richer as a result of the glial cell increase, allowing for more complex thought.

Clark (1983) also contends that more use is made of the prefrontal cortex of the brain of the gifted, enabling planning, insight, and intuition development. Alpha wave activity appears to be increased within more areas of the brain of the gifted. This alpha state allows for more relaxed and concentrated learning with higher retention levels. Brain rhythms tend to synchronize more harmoniously in the gifted, improving concentration, attention, and problem solving.

While Clark (1983) lays the biological foundation for a "super" nervous system, several other investigators are exploring the "OE phenomenon." In a thorough review of relevant literature, Silverman (1983) summarizes Dabrowski's theory of "overex-citabilities" (OE's). Dabrowski (cited in Silverman, 1983, p. 14) defined overex-citabilities as "heightened sensitivities to various kinds of stimuli which create tension within the nervous system." Five forms of psychic overexcitability were identified by Dabrowski: psychomotor, sensual, intellectual, imaginational, and emotional. Piechowski (1979) describes each form, or mode, as "a channel through which flows information in the form of sensations, feeling, experience, images, expectations, etc." (p.29). These five dimensions thus serve as the "main channels of perception" (p.29). If more than one of these channels are fully open, then the abundance of stimuli received leads to tension and conflict in the individual, while at the same time intensifying that individual's creativity. Therefore, the greater the number and the intensity of these overexcitabilities, the greater the individual's "potential for higher level development" (Silverman, 1983, p.15).

The psychomotor overexcitability is seen as an abundance of physical energy and activity. The sensual mode involves the heightened capacity to derive sensory pleasure from the five senses. Intellectual overexcitability is "associated with an intensified activity of the mind" (Piechowski & Colangelo, 1984, p.82). This mode grants the individual "sustained intellectual effort" as

observed in "questioning, analysis, problem solving, and theoretical thinking" (Silverman, 1983, p. 14). The imaginational dimension is recognized through the creative activities of invention, visualization, and the use of verbal and figurative imagery. Intense feelings, inhibition, fear, anxiety, enthusiasm, and self-judgment are products of the emotional mode.

Silverman (cited in Silverman, 1983, p.9) confirms the belief of other observers of the gifted by stating, "the heightened sensitivity shown by these children is an extremely pervasive trait." She relates the "excruciating sensitivity" (p.7) to possibly a more highly developed nervous system. Unfortunately, these characteristics of over-excitabilities are rarely valued in society and are often regarded as neurotic in nature (Dabrowski, cited in Silverman, 1983). Barron (1976), in his intensive investigation of the creative personality, gives credence to this belief as he describes the highly creative individual as moody, preoccupied, and self-centered. Barron finds the highly creative as having more "Psychopathology"; however, he concludes that "they also have far greater resources with which to deal with their troubles" (p. 197).

Piechowski and Colangelo (1984) have concluded research that lends further support to Dabrowski's theory. These authors agree that overexcitabilities are regarded by society as "nervousness, hyperactivity, neurotic temperament, excessive emotionality, and emotional intensity that most people find un-comfortable at close range" (p.81). To test their theory that the gifted have an abundance of overexcitabilities, Piechowski and Colangelo administered an Overexcitability Questionnaire to gifted adolescents, as well as to gifted and nongifted adults. In comparing the profiles, both gifted adolescents and gifted adults, as a group, were higher in imaginational, emotional, and intellectual overexcitabilities than were the nongifted adults. Psychomotor and sensual overexcitability differences were not significant among the three groups.

Two other researchers concur with the results of Piechowski and Colangelo (1984). Schiever (1985) examined the relationship between the creative personality and Dabrowski's psychic overexcitabilities in seventh and eighth-grade students. Imaginational, emotional, and intellectual overexcitabilities were found to correlate with the creative personality characteristics. Differences on psychomotor and sensual overexcitabilities were not significant. As a result of these findings, Schiever suggests that "giftedness permeates every fiber of the gifted person's being" (p.226). She also recommends additional study to explore "neurological and other physical bases for and links to OE" (p.226).

Gallagher (1985), in studying gifted and nongifted sixth-grade students to determine the relationship between levels of overexcitability and giftedness, found significant differences along these three modes of overexcitability: intellectual, imaginational, and emotional. Gallagher summarizes that "emotional sensitivity may walk hand in hand with superior intellectual ability" (p.l19).

Thus, having reviewed the research of several investigators in the preceding pages, it can be concluded that a hypersensitive nervous system is a pervasive characteristic of the gifted and talented. The question that remains to be explored in this paper is: Are the gifted, because of their highly sensitive nervous systems, more vulnerable to the opportunistic agent, *Candida albicans?* The causes of and the symptoms of infection by this yeast will be described in great detail in order to help the educator or parent recognize a possible physical cause for an individual's maladaptive behavior and refer him or her to a physician who deals with environmental illness and immune system deficiencies.

Chronic candidiasis is a continuing infection by a yeast type of fungus. The primary etiologic organism is usually the *Candida albicans* species of yeast (Bodey and Fains-tein, 1985; Crook, 1984; Truss, 1983). The condition is one in which many organs become affected and function improperly. The manifestations of the illness "take many forms and can become so severe as to be totally incapacitating" (Truss, 1983, p.5). *Candida albicans* normally lives in everyone, usually without causing symptoms or damage to its human host. Under certain conditions the organism will invade and colonize the mucous membranes, skin, and nails. The yeast grows prolifically in the large intestine and in the vagina of females. When *Candida albicans* invades and persists in the tissues, it may lead to symptoms that are easily confused

with illnesses that are psychological in nature (Truss, 1978). In fact, almost all candidiasis patients, in their search for a solution to their problem, are eventually told that their condition is psychosomatic in origin and are referred to a psychiatrist whose treatment is tried without benefit (Truss, 1983).

Candida albicans, more familiarly known as monilia, has long been recognized as a cause of chronic vaginal and intestinal symptoms. Less well known is the relatively recent discovery that once the yeast is established in these tissues, it releases toxins into the bloodstream. These yeast products can do great harm to other systems of the body, including the central nervous system and the female hormone cycle. As a result, the chemistry of the brain may become distorted, resulting in symptoms of: anxiety; depression; impaired memory, concentration, and reasoning; confusion, low self-esteem; inappropriate emotions; distortion of the five senses; hyperactivity; uncontrollable crying; and explosive irritability (Crook, 1984; Truss, 1983). The psychiatrist may be useful in helping the patient adjust to these symptoms, but the real tragedy lies in not correcting the underlying physiologic cause of the illness (Truss, 1981). Truss (1983) refers to this tragedy as a "diagnostic catastrophe" (p. 10) and urges physicians not to label someone as "psychoneurotic" when all possible physical causes have yet to be explored. Unfortunately, physicians and psychiatrists all too often assume that stress or an unhappy personal situation causes the symptoms. Sometimes this diagnostic assumption is accurate; sometimes the two events are coincidental; and sometimes the physical condition causes the psychological manifestations (Truss, 1983).

However, Truss (1983) does not feel that candidiasis is the only possible cause of distressing emotional symptoms, for he states, "Undoubtedly yet to be discovered are many physical causes of abnormal brain function..." (p. 10). He suggests that many physical causes are obvious (i.e., birth and later injuries to the brain, high fever, and brain tumors). Other causes are more subtle and as yet not fully recognized by the majority of the medical community (i.e., nutritional deficiency; chemical imbalance; allergy; or poisoning by metals, chemicals, and toxins of infectious agents). Abdo (1985) supports Truss in a discussion of the role of nutritional deficiencies as the cause of allergies, learning disabilities, and emotional problems. Allergic responses in the brain may further result from inhalants, such as pollen, dust, and mold spores; foods; and infectious agents, such as *Candida albicans.* Interestingly enough, the antidepressants that are prescribed for psychiatric problems have an antihistamine activity. Antihistamines are a commonly prescribed treatment for allergies (R. Brandt, personal communication, September 3, 1985).

The allergic responses to the toxins produced by the growth of *Candida albicans* in the body tissues may also cause a variety of physical symptoms, which are described in detail by Crook (1984) and Truss (1978, 1980, 1981, 1983). Migraine and sinus headaches are a frequent complaint, as are inflammation of the nose, ears, sinuses, and bronchial tubes (asthma). Urethra and bladder infections (cystitis) are common. Intestinal symptoms of bloating, diarrhea, constipation, or cramping may occur. Oral thrush, acne, hives, and other skin irritations may be present. The female hormone cycle is also implicated with symptoms of irregular menstrual cycles, cramps, premenstrual tension, endometriosis, loss of libido, and chronic vaginitis. Prostatitis is a parallel complication in males. Aching in the muscles and joints, lethargy, chronic fatigue, incoordination, and dizziness are often noted. Intolerance to chemicals in foods, drugs, and inhalants, also referred to as environmental or ecologic illness, is commonly a result of candidiasis.

Thus, a picture evolves of the candidiasis patient, as one who has practically every body system, as well as intellectual and emotional functioning, impaired by the overgrowth of this yeast organism. Without the support and guidance of a knowledgeable physician, the individual is virtually helpless to carry out even the simplest task, much less a job that is intellectually and physically demanding. Eventually, the patient may become hopelessly isolated as relationships with family and friends tend to disintegrate. Truss (1983) emphasizes repeatedly that a total lack of self-confidence occurs both as a result of the disease and also as a result of the symptoms. Suicide all too often appears to be

the only solution for the victim of candidiasis.

The causes of candidiasis are as multi-dimensional as are the resulting symptoms. Bodey and Fainstein (1985) believe that "very minor and subtle defects in host defenses will allow these organisms (i.e. yeasts) to invade and cause illness" (p.53). These doctors have discussed several contributing factors (i.e., impaired gastric acid secretion; protein deficiency; high lipid and /or carbohydrate levels in the blood; and alterations in the chemical environment of mucous membranes). Recent medical developments have greatly aggravated this problem of yeast overgrowth, chief among which is the widespread use of antibiotics, especially the broad-spectrum antibiotics that are designed to kill a wide range of bacteria (Bodey and Fainstein, 1985; Crook, 1984; Truss, 1983). These antibiotics alter the normal flora of the body by killing even the beneficial bacteria. The yeast organisms that also live in the intestine are therefore able to dominate the environment and release chemical toxins which are absorbed through the intestinal mucosa into the bloodstream and then carried to all parts of the body. Other recent medical developments which have contributed to candidiasis are oral contraceptives (birth-control pills) and cortisone-type drugs. Malnutrition, pregnancy, menses, smoking, and illnesses such as influenza can also alter the host's defenses and predispose the body to Candida infections.

Candidiasis is particularly important to the girl entering puberty because of the menstrual irregularities and emotional disturbances so often seen at this time. This condition may also be exacerbated by the use of antibiotics (especially tetracycline) for acne. Teenage boys with candidiasis may appear depressed, ill-tempered, and lacking in self-confidence and ambition. They, too, may have acne and may be receiving antibiotics as treatment. Intellectual impairment may occur, with school work suffering and dropping-out becoming a possibility.

Progress in the treatment of candidiasis has been slowed by "limitations in diagnosis" (Bodey & Fainstein, 1985, p.v.). Microbiological cultures and blood tests are an unreliable means of establishing the diagnosis because the Candida organism is present in the tissues of normally healthy individuals as well. Additional research is clearly indicated in the areas of diagnosis and treatment. Because of the lack of statistical experimental evidence and the lack of accurate screening devices, treatment depends almost entirely on case history and therapeutic trial rounds of anti-yeast medication to see if it is effective. Nystatin is the anti-fungal drug most widely used in initial treatment. Other medications may also be prescribed (i.e., amphotericin B, miconazole, and ketoconazole).

Occasionally, the only treatment necessary is the individual's withdrawal from the antibiotic which aggravated the yeast condition in the first place. Treatment also involves the avoidance of birth-control pills and immunosuppressant drugs, drugs that suppress the body's own immune defenses (i.e., cortisone). In some cases yeast vaccines are given to stimulate the body's immune system to aid in clearing this organism from body tissues. Since yeasts multiply rapidly when starches and sugars are available, a diet low in carbohydrates is recommended. Foods with a high yeast or mold content (e.g., alcoholic beverages, mushrooms, vinegar, aged cheeses, bread with a high yeast content) often cause an increase in allergic symptoms and are not advised for the Candida patient. Truss (1980) also advocates the avoidance of environments with a high mold-spore exposure, the treatment of allergy and hypothyroid problems, and the correction of poor nutrition.

The very existence of an overgrowth of *Candida albicans* is seen by Truss (1978, 1983) as an indication of a weakened immune system. Truss (1983) suggests that this weakness is due to a genetic predisposition. Crook (1984) and Truss (1978, 1983) both view the condition as an immunologic problem. Therefore, the solution to the problem is also immunologic in nature. The goal of treatment then becomes to allow the immune system to regain its lost ability to eradicate the yeast from the body tissues. The treatment described in the previous paragraphs allows this renewal of the immune system to occur, although a great deal of patience and time are required for a complete recovery. Relapses may occur frequently throughout the course of treatment, but with constant suppression of *Candida albicans,* the tissues slowly recover from the yeast's toxins, and

the organs return to their normal functions. Truss (1983) concludes that "self-confidence replaces self-doubt" (p. 18) until the individual is once again able to function in his or her place in society.

Two case studies follow which will serve as examples of the symptoms and management of candidiasis in gifted individuals. Crook (1984) relates a case involving the 13-year-old daughter of another physician. The girl was an advanced and well-coordinated gymnast. However, she had experienced periods of moodiness, depression, and fatigue since infancy. More recently, she had noticed periodic changes in her ability to concentrate and to coordinate her movements, two skills essential to gymnastic competency. When the girl was placed on a Candida control diet and anti-fungal therapy, her symptoms improved. She was able to practice her gymnastics with skill and confidence. When she neglected her diet and medication, her moodiness and marked fatigue would return, and she would show a lack of coordination in her gymnastic movements.

Crook (1984) also tells of a 17-year-old boy who enjoyed many economic, educational, and cultural advantages. He was handsome, talented, and intelligent. Yet, the boy was depressed to the point of being suicidal. After spending two months in a hospital for disturbed adolescents, he was put on an anti-fungal treatment program. The results were immediate and dramatic. The depression disappeared and the boy eagerly began making plans for college and his future.

Treatment appears to be even more optimistic for the future as new drugs are discovered to stimulate the immune system and to eliminate the Candida organism. Recently, a new anti-fungal agent, caprylic acid, has been introduced and tried with encouraging results (A. Worrell, personal communication, March 25, 1986). Furthermore, new laboratory tests are being developed in order to scientifically evaluate nutritional deficiencies and enzyme levels (A. Worrell, personal communication, March 25, 1986).

Certainly, the gifted and talented as a group are as susceptible as anyone else to the destructive action of *Candida albicans,* and possibly more so. It has been the personal observation of this author that many gifted individuals do indeed suffer from candidiasis, environmental illness, and allergies. Could the highly attuned nervous system of the gifted render them more vulnerable in some way to opportunistic agents? Does a subtle connection exist between candidiasis and the gifted? So far, no experimental research has proven or even tested this possible correlation. There is a great need for statistical research in the area of Candida related illness. Thus far, case studies have been used exclusively. Better methods of detecting this condition will have to be developed first before statistical research can occur. Further studies to evaluate the possible relationship between candidiasis and giftedness are recommended.

Educators and parents of the gifted should give consideration to candidiasis and related environmental illness when dealing with children and young adults who are experiencing social and emotional problems. There may even be a relationship between candidiasis and underachievement. Whitmore (personal communication, March 3, 1986) cautioned educators of the gifted to first rule out possible physical causes for underachievement. Candidiasis should be considered a possible physical cause of underachievement (Crook, 1984; Truss, 1983).

Since giftedness is a biologically rooted concept, as seen in the increased production of glial cells and neuron networks (Clark, 1983), the gifted may actually have more glial cells to become affected by the Candida toxins. The debilitating effects of *Candida albicans* may be more pronounced in an individual with a greater central nervous system capacity. Gifted individuals, who are characteristically hypersensitive to their external environment, may also exhibit a hypersensitivity to their internal environment. The creative spark may be remarkably diminished in a gifted person whose nervous system, hormone cycle, immune system, and mental health are continually being subjected to the suppressing effects of chronic candidiasis. This diminishment in creativity could in itself be a source of severe frustration and depression for the gifted individual.

A poignant example from Truss (1983) illustrates the plight of the gifted mind inhibited by candidiasis. A pre-medical student

came to Dr. Truss with an unusual complaint. Since he was a small boy, the young man had dreamed of becoming a doctor. Now, in his third year of college, he was making low grades although he was highly motivated and studied constantly. He was unable to concentrate and to memorize details. No medical school would accept him with grades of C's and D's. The student's main physical symptom was nasal allergy. Since allergy treatments did not help in this case and the young man had a previous history of antibiotic therapy, Dr. Truss decided to try anti-fungal treatment for candidiasis. This approach was immediately successful and the student was symptom-free for several years. Six months after beginning Candida treatment, this young man realized the potential that had been denied him by chronic candidiasis. His grades improved markedly in his senior year. The admissions committee would not accept him for medical school unless he would be willing to return to pre-med for two more quarters to prove that his recent level of performance could actually be sustained. He did return to college and was able to maintain the higher grade point. Consequently, he was admitted to medical school.

In the preceding case, had the young man not found help for his chronic candidiasis, he would have remained an under achiever, despite being highly motivated, and would never have reached his full intellectual promise. One can only wonder how many other gifted individuals remain the victims of an undetected medical problem — chronic candidiasis.

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Letters

Dear Sir:

We are physicians at the Cancer Institute, University of Messina, who wish to report to the American people a treatment we have been using in Italy for cancer, using an immunostimulating natural product. For several years we had watched our patients being treated by standard techniques gradually worsen after chemotherapy and radiation therapy. These observations persuaded us to try alternative forms of treatment.

After many years of experiments on animals and later on volunteers, we prepared a natural biologic extract of animal material called 1MB, or Immunomodulator Biologic. From 1979 1MB has been the most commonly used alternative therapy in Italy. This has placed us on a direct collision course with official medicine which does not offer this particular treatment to patients. The many positive results which we have obtained and thousands of medical reports which certify recovery have been ignored. They have, in fact, attempted to persuade us to discontinue this treatment using financial incentives and later threats. The increasing demand for 1MB has persuaded us to open centers of distribution in some Italian cities including Rome, Bologna, Naples, Foggis, Cagliari and Messina, where hundreds of patients and their relatives come for treatment.

The 1MB is a nonspecific active immuno-therapy and it functions by stimulating the T and B lymphocytes and macrophages. Moreover, it increases the production of interferon and interleukine. The 1MB is administered intramuscularly and has no side effects. All types of cancer respond to 1MB therapy, but in particular brain, lung, pancreas and stomach. We have cured 9,765 cases, and the majority of these patients were in the terminal stage at the moment of therapy with diffuse metastases, very marked symptomatology, severe pain and altered blood values.

In 90 percent of cases the pain disappears, the weight and appetite increase, blood values and CEA normalize. 1MB therapy increased survival time, decreased the neoplastic mass and the metastases or tended to stabilize them. In several cases we have obtained regression of the neoplastic disease. Patients also have a better life. Often patients who were in bed were able to get up and resume work. Of course the outcome of the therapy depends upon the general condition, on the immune system, and therefore on treatment previously given. In fact the outcome is better in patients not treated with chemotherapy or radiation therapy.

We know that our university career has been finished by what we have done, but our consciences are clear. We mean to keep helping patients who turn to us. We would be happy to send copies of our results to investigators who wish to try 1MB since we hope that patients and doctors outside Italy can benefit by the positive results of this therapy.

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