

Treatment of Chronic Anxiety and Associated Physical Complaints with Niacinamide and Essential Fatty Acids: Two Cases

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Research has come a long way since the decades when Hoffer and Osmond were subjects of derision for suggesting psychiatric uses for niacinamide, and Rudin was ignored for his suggestions of similar use for essential fatty acids.

Two individuals with major complaints of chronic anxiety and biochemically and organically related chronic problems (including osteoarthritis, hyperglycemia and hyperinsulinism, hypertension, and elevated cholesterol/HDL ratios) are described. The interrelationships of the "physical" and "psychological" complaints are discussed. Remission of both "psychological" and "physical" complaints co-incident with treatment (diet change, niacinamide, omega-3 fatty acids) is described.

Case 1

DC, 57, of Scotch-Irish ancestry came in for treatment of anxiety. She had a 35 year history of treatment with psychotherapy and medication, initially with "Miltown", briefly with barbiturates, and then with Librium and Valium. She had become suspicious of addiction to Valium, had read popular and medical material on Valium addiction, and had stopped it with what she described as "a great deal of difficulty". Her psychotherapist had suggested other medication, but she declined and decided to try to "tough it out" with no medication and continuing psychotherapy. This was increasingly difficult, and she came in about possible alternatives.

She said her psychotherapist's diagnosis (as well as previous therapists) had been "chronic anxiety". She reported anxiety about her children, especially about their health, and about her husband's job and the family finances. She said she was frequently irritable, restless, had difficulty falling asleep, had intermittent diarrhea, was chronically fatigued, had difficulty concentrating,

and was often dizzy or lightheaded.

She pointed out that medication, especially the Librium and Valium, had relieved or improved nearly all of these symptoms, but reiterated that she no longer wanted to take them.

Other complaints included intermittent swelling and pain (especially with exercise) in both knees, as well some finger joints. She reported mild hypertension of 3 years duration. She pointed out her hair was "lifeless", and that her nails broke easily.

She'd been hospitalized for childbirth twice, and for D & C as well as T & A. She had no known allergies, had been in no serious accidents. Currently she was on no regular medication, although she'd been urged to go back on anti-anxiety medication and to start antihypertensives. She reported increased use (although not daily) of aspirin for knee pain and swelling.

Both her father and brother had diabetes treated with oral medication. Her brother and sister (both older) were hypertensive. Her mother had had knee-joint replacement surgery. One grandmother had had osteoporosis. Her daughter had reactive hypoglycemia.

She had never smoked tobacco or marijuana, and rarely drank alcohol. She "hardly ever" drank coffee as it "makes me absolutely wired". She got very little vigorous exercise.

She was 5'3", 161 pounds. Her blood pressure was 156/102. Several of her fingernails were chipped, and her hair appeared somewhat dull. Her skin was quite dry, with slight flakiness on the forearms and lower legs. Four of her p-i-p joints were enlarged, although only the left index finger's p-i-p joint was tender. She also had non-tender nodes on three d-i-p joints. Both her knee joints were enlarged, the left more than the right. Compression of each knee with simultaneous flexion and extension disclosed considerable

1. This is an address for Jonathan Wright that may or may not take up two lines.

grating. The rest of her physical exam appeared to be normal.

Her CBC and UA were normal. "SMA" disclosed triglycerides to be 220 (n=35-150), cholesterol 278, HDL cholesterol 57 (chol/ HDL ratio 4.9, "average" 4.4). Digestive analysis showed mild to moderate hypochlorhydria.

Six hour glucose-insulin tolerance testing showed both a mildly hyperglycemic and moderately hyperinsulinemic response to sugar load. (FBS 102, 1/2 hr 220, 1 hr 220, 2 hr 186, 3 hr 142, 4 hr 120, 5 hr 102, 6 hr 90; Fasting insulin 12, 1/2 hr 316, 1 hr 290, 2 hr 226, 3 hr 102, 4 hr 38, 5 hr 20, 6 hr 16. See Kraft.¹)

X-rays of her knees (taken the prior year) disclosed early osteoarthritic changes.

Mineral analysis (combined WBC, RBC, hair) showed chromium below detection limits, low zinc and magnesium.

Case 2

RJ, 51, an engineer of northern European ancestry, was first seen with his wife. His stated complaint was slowly increasing hypertension for which he'd so far declined prescription medication. His wife gave her opinion that RJ's "chronic excess nervous tension", which she noted "ran in his family" was the ultimate cause of his blood pressure problem.

The J's had been married 27 years. Mrs. J. (who characterized herself as "easygoing") pointed out that ever since she'd known RJ he'd "always been excessively worried about something". Earlier in their marriage, she'd encouraged him to seek professional help for "excess worrying", but he'd declined. When questioned, RJ readily admitted "I'm a worrier", but said he "came by it honestly"; he said his mother worries even more and had been given "tranquilizers" from time to time. His maternal grandfather was a "family legend" for worrying, but had "put it to good use" as an accountant.

Specifically, RJ (and his wife) noted he worried most often about his job performance, finances, and "any number of little things". He often had difficulty going to sleep. RJ noted increased difficulty concentrating, particularly at work, and more lightheadedness, which he attributed to his increasing blood pressure. His wife said he'd had these symptoms for years, and that his mother had

them also. She also said he was frequently irritable, restless, and seemed to have "an unusual amount of muscle tension", particularly in the back. She frequently gave him massages, which seemed to relieve him a little.

Mrs. J. pointed out that RJ channeled his nervous tension into his work, and that he was "a workaholic". RJ said he noticed when he was more irritable, "keeping to myself and working harder" seemed to help.

Both RJ and his wife denied he'd ever had significant depression, "except when something really bad happened", such as a parent's death. RJ said "I worry too much to get depressed".

RJ said he suffered from occasional headaches, mostly relieved by aspirin. He had some aching in his knees, left worse than right, especially after exercise, but no swelling. An old injury to his right ankle ached "more often than not", but "not too badly", and was frequently slightly swollen. He denied other symptoms.

In his 20's, he'd had a duodenal ulcer. He'd had his tonsils out as a child. He had no known allergies, had been in no major accidents, was taking no medications regularly.

His mother had "diet-controlled" diabetes. His father had died in his 30's of an accident. His brother was a recovering alcoholic. His maternal grandfather had died of a stroke.

RJ quit smoking tobacco 20 years before; his wife said "he got even more nervous after that". He'd not smoked anything else. He drank alcohol and caffeine-containing beverages only occasionally. He walked a lot when he felt restless, but got very little other exercise.

RJ was 5' 11", 178 pounds. His blood pressure was 175/105. He appeared more tense than average. He had slightly dry skin, with some flakiness on the lower legs, and some dandruff. Both external ear canals were packed with hard dry wax (RJ said this was a lifelong problem). His right ankle was larger than the left, and appeared slightly "puffy". On compression with accompanying flexion and extension, grating could be felt in both knees, the left worse than the right. Otherwise, his physical exam was normal for his age.

CBC, ferritin, UA, and "SMA" were all within lab normal except cholesterol 243 and HDL cholesterol 38 (chol/HDL ratio 6.4, "average"

ratio 5.0). Digestive analysis was normal.

His 6 hour glucose-insulin tolerance test showed a relatively normal glucose curve (F 98, 1/2 hr 178, 1 hr 160, 2 hr 138, 3 hr 112, 4 hr 100, 5 hr 78, 6 hr 80) but his insulin curve was abnormal (F 6, 1/2 hr 160, 1 hr 170, 2 hr 98, 3 hr 46, 4 hr 16, 5 hr 10, 6 hr 4; this response is "hyperinsulinemic" if the sum of the 2nd and 3rd hour insulin values are $> 100^1$).

Mineral analysis (combined WBC, RBC, and hair testing) showed non-detectable levels of chromium and selenium, and marginal levels of zinc.

Diagnostic and Treatment Clues: DC and RJ

DC had a prior diagnosis of "chronic anxiety"; typical drug treatment, particularly benzodiazepines, had been effective. RJ appeared chronically anxious, although adjusted to his apparent anxiety. Anxiety could be traced back 2 generations in RJ's family.

DC had definite osteoarthritis in the knees and fingers; RJ had beginning osteoarthritis in the knees, and a post-traumatic arthritis in one ankle.

DC had distinct signs of essential fatty acid deficiency (dry hair, dry skin, brittle nails). RJ had signs of essential fatty acid deficiency (dry flaky skin, excess hard ear wax).

DCs response to a sugar challenge was both hypoglycemic and strongly hyperinsulinemic. RJ had a normoglycemic but hyperinsulinemic response to a sugar load.

DC had mild hypertension; RJ had mild to moderate hypertension.

DC had elevated triglycerides; both DC and RJ had a slightly elevated cholesterol/HDL ratio.

Correlations from the Literature

Mohler² has reported: "nicotinamide has properties in common with benzodiazepines (and barbiturates) in its action on spinal cord activity, and its anticonflict, anticonvulsant, antiaggressive, muscle relaxant, and hypnotic action". Kennedy³ reported: "this drug (niacinamide) has a qualitatively similar effect to diazepam on the turnover of serotonin, noradrenaline, dopamine and GABA in those areas of the brain that are thought to be deranged in anxiety".

Kaufman⁴ in an exhaustively complete eight-year study of over 800 individuals with

osteoarthritis demonstrated conclusively that niacinamide could not only arrest but partially reverse the signs and symptoms of osteoarthritis.

Rudin⁵ has described response of "neurotic" symptoms, including anxiety, to essential fatty acid treatment. Both DC and RJ had "classic" essential fatty acid deficiency signs.

In an extensive review of the biochemistry of oxidation damage to the pancreatic beta cells, Cleary⁶ points out that cytosol levels of NAD (niacinamide adenine dinucleotide) drop dramatically after such damage. Without NAD, normal mitochondrial ATP production declines, so membrane transport of glucose (bloodstream cell, ATP dependent) is also seriously impaired.

Niacinamide is an immediate precursor of NAD; as long ago as 1950, Lazarow⁷ reported that niacinamide was protective against alloxan-induced oxidative damage to the beta cells and subsequent diabetes in experimental animals. In 1981, Yamamoto⁸ confirmed this finding, and extended the observation of niacinamide protection to streptozotocin-caused oxidative damage.

Kraft's study¹ of 3650 glucose-insulin tolerance tests established criteria for "diabetes-in-situ" ("occult" diabetes or "prediabetes"). Particularly DC, but also RJ meet Kraft's criteria.

Much recent investigation⁹⁻¹² has demonstrated a connection between postprandial or post-glucose-load hyperinsulinism and hypertension. A summary editorial¹³ observes: "the finding of insulin resistance and hyperinsulinemia in non-obese patients with hypertension raises the possibility of a fundamental relation between insulin and blood pressure that transcends the narrower association of insulin with obesity-related hypertension" and "hyperinsulinism was observed in hypertensive subjects after they ingested glucose. Fasting insulin levels were normal."

In a study of 20 obese and 20 non-obese men, Fuh et al¹⁴ observed: "the greater the plasma glucose and insulin response to oral glucose, the lower the plasma HDL concentrations, and the higher the ratio of plasma LDL cholesterol to HDL cholesterol."

(Hypothesizing a link between insulin response to sugar load and disturbances of mental function,

Hudspeth et al¹⁵ recorded EEG's on 37 individuals undergoing glucose tolerance tests (unfortunately not glucose-insulin tolerance tests). 27% showed EEG changes of the form generally associated with disturbances of consciousness and mood. These EEG changes could not be correlated with glucose nadir or rapid changes in the blood sugar level. Citing earlier research showing a direct effect of insulin on water and electrolyte flux into the brain, they hypothesized that insulin-induced cerebral hyperosmolarity may be a cause of psychological and neurological distress in some individuals.)

Treatment and Outcome (Briefly)

Based on the above symptoms, signs, laboratory abnormalities, suggestions from the literature, and clinical experience, DC and RJ were both advised to start on diets free of sugar and other simple carbohydrates, and relatively low on salt.

Both DC and RJ were started on niacinamide, 1200 mg twice daily of an effective time-release preparation (400 mg capsules, 3 BID). (They were advised to cut back or stop if any nausea or queasiness occurred.)

They also were started on linseed oil capsules, 1000 mg each, 3 BID. (Vitamin E 400 IU was added to prevent lipid peroxidation from long-term ingestion of essential fatty acids.)

DC was asked to take chromium picolinate 500 mcg BID, magnesium aspartate 200 mg daily, and zinc picolinate 30 mg daily, and a good general multiple vitamin-mineral.

RJ was also advised to take chromium picolinate 500 mcg BID, zinc picolinate 30 mg BID and selenium 200 mcg daily, and a good general multiple vitamin-mineral.

(DC was advised to use betaine hydrochloride-pepsin with meals to facilitate protein digestion and mineral assimilation.)

Both DC and RJ (as well as Mrs. J) reported a rapid improvement in all symptoms of anxiety noted above. Initial improvement was noted within 48 hours; near-complete resolution occurred within one month. DC was able to cut back to 800 mg niacinamide BID; RJ had to continue at 1200 mg BID, or some of his symptoms returned partially. Mrs. J noted particularly that RJ had considerably less muscle tension, requiring fewer massages.

As predicted by Kaufman,⁴ arthritic pain

disappeared for both DC and RJ in 3 to 4 weeks. DC's knee swelling also disappeared, although her finger thickening and nodularity did not.

RJ's hypertension resolved in 4 months; DCs took 9 to subside to 136/90; to date it's not gone lower persistently.

Both DC and RJ had lower-than-average cholesterol/HDL ratios at a 6-month recheck. (Ordinarily, niacinamide is much less effective than niacin for cholesterol control.)

DC noted that her skin was no longer dry in 4 months, and her hair was "not dry and lifeless but more glossy". Her nails quit chipping and grew well by 9 months. RJ didn't comment on his skin, but his wife noted it was no longer dry and his dandruff nearly gone at 6 months.

In addition to control of symptoms of anxiety, both DC and RJ noted considerably more energy and a "better outlook on life".

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