

Polyamine Levels in Jail Inmates

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Morris County Jail inmates were found to have abnormal levels of blood polyamines. Inmate average blood levels of spermidine were significantly lower than normal blood levels ($p < .007$). Inmates having the lowest blood spermidine levels had committed significantly more violent crimes than inmates having normal blood spermidine levels ($p < .05$). Inmate average blood levels of spermine were significantly lower than normal blood levels ($p < .05$). Low spermine is one of several indications of relative hypoglycemia noted in Morris County Jail inmates. Inmates had a broad range in blood levels of histamine, approaching the histamine range found in schizophrenics. The relationship of spermine to diet is discussed, and the need for further research into the relationship of polyamines to behavior is emphasized.

BACKGROUND

We became interested in the relationship between blood polyamine parameters and behavior among jail inmates as abnormal blood levels of polyamines have been found in schizophrenics (Pfeiffer et al., 1969) and many personality test scores of inmates resemble those of schizophrenics. Abnormal polyamine levels were found by Pfeiffer to vary with scores on certain psychological tests. Therefore, we originally decided to measure inmate polyamine levels to see if inmate blood levels resembled those found by Pfeiffer in schizophrenics and if similar relationships existed between polyamine levels and psychological profiles.

Also, according to Pfeiffer (1973a, 1973b), low levels of spermine, a polyamine, may indicate relative hypoglycemia (low blood sugar). Persons with hypoglycemia can exhibit behavior disturbances independently of schizophrenia. We have noted indications of a high incidence of hypoglycemia among jail inmates (D'Asaro, 1974).

Spermidine

In a preliminary blood study we noted that inmate blood levels of the poly-

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mine spermidine were extremely low (Groesbeck, D'Asaro, and Nigro, 1973). The lowest spermidine levels were most frequent in inmates charged with violent crimes. The lowest inmate spermidine levels appeared with high extroversion scores on the Eysenck Personality Inventory. The extroversion result was interesting in that schizophrenics, who tend to be introverted (Eysenck, 1968), tend to have high blood levels of spermidine (Pfeiffer, 1970).

Spermine

We also noted low blood levels of the polyamine spermine among jail inmates. According to Pfeiffer (1973a, 1973b), low spermine levels indicate hypoglycemia (low blood sugar).

Histamine

We noted that the distribution of another polyamine, histamine, appeared abnormal. The large standard deviation (representing a large spread of scores, from very low to very high) approached that found among schizophrenics (Pfeiffer, 1970). Inmates' blood histamine levels varied from 0 to 120 Ng/ml, S.D. ±29.

We also noticed some relationship in the direction found in schizophrenics by Pfeiffer (1973a) between histamine levels

and control beliefs (Groesbeck and Nigro, 1973).

PURPOSE OF THE PRESENT STUDY

We repeated blood tests and psychological testing to check out unpredicted results of the first testing. On this second testing we predicted: (1) low spermidine; (2) low spermidine levels appearing with violent crimes and/or high extroversion; (3) low spermine levels; (4) histamine levels spanning a broad range and related to locus of control.

PROCEDURE

Blood was drawn from 30 inmate volunteers. Duplicate samples were delivered the same day to the Brain Bio Center, 1225 State Road, Princeton, NJ. Analyses used fluorescent methods after column chromatography (Pfeiffer and Iliev, 1969).

RESULTS

Spermidine

As predicted, the average blood spermidine level of inmates again was extremely low as compared to the normal average (p<.001, see Table 1). On this testing, spermidine levels showed no

TABLE 1

Spermidine Levels (male)	Mean	S.D.
Morris County Jail inmates: (N = 30)	0.75mcg/ml	±.0.18 (p<.001)
Normals:	1.0mcg/ml	±.0.19

*Polyamine levels of normal, schizophrenic, and hypoglycemic males from Brain Bio Center, Princeton, N.J.

TABLE 2

Low spermidine Inmates (N=7)		Normal spermidine Inmates (N=7)
Total t of violent crimes:	25 (p<.05)	9
Average # of violent crimes:	3.57	1.29
S.D.:	2.51	.95

relationship to the personality trait extroversion, as had appeared on the first testing. However, as predicted and as noted previously, inmates having the lowest blood spermidine levels had committed more violent crimes than other inmates (see Table 2).

The number of violent crimes committed by the seven inmates having the most extreme low blood spermidine levels (below .60) was compared to the number of violent crimes committed by the seven inmates having the highest spermidine levels (normal, .88 to 1.26).⁴ Low spermidine inmates had committed significantly more violent crimes ($p < .05$).

Spermine

Inmate spermine levels were significantly lower than normal levels, as predicted ($p < .05$, see Table 3).

Histamine

Inmate histamine levels continued to have the broad spread reported in schizophrenics (see Table 4).

We did not find the relationship between histamine levels and control beliefs which we had noted on the previous test.

⁴ Violent crimes included: murder, rape, assault, atrocious assault, armed robbery.

DISCUSSION

Spermine

Both testings showed significantly low spermine values, indicative of hypoglycemia. We have other indications that a large percentage of inmates suffer from some degree of low blood sugar, most probably secondary to drug and alcohol addiction (D'Asaro, 1974). Relative hypoglycemia can precipitate antisocial or criminal behavior. Because treatment of hypoglycemia is mainly dietary, inmates should be counseled as to proper diet—avoidance of sugar, caffeine, alcohol, drugs, and long fasts.

There is a great need for a commercially available snack item, high in protein, very low in sugar, and packaged suitably for easy distribution in institutions as jails, prisons, and mental hospitals. Such a snack item would tide inmates over any long foodless period, as between dinner and breakfast. Any industry interested in manufacturing such an item should consult with both nutritionists and prison wardens as to composition, packaging, etc., in order to meet dietary needs and administrative needs in terms of prison sanitation and security.

Spermidine and Histamine

The reason for abnormally low spermidine levels and abnormal histamine ranges in inmates should be investigated.

TABLE 3

Spermine Levels (male)

	Mean	S.D.
Morris County Jail inmates: (N = 30)	1.25mcg/ml	±0.45 (p<.05)
Normals:*	1.48mcg/ml	±0.34

*Polyamine levels of normal, schizophrenic, and hypoglycemic males from Brain Bio Center, Princeton, N.J.

TABLE 4

Histamine Levels (male)

	Mean	S.D.
Morris County Jail inmates:	60Ng/ml	±29
Normals:* approximately	51Ng/ml	±16
Schizophrenic males:"	59Ng/ml	±37

*Polyamine levels of normal, schizophrenic, and hypoglycemic males from Brain Bio Center, Princeton, N.J.

The relationship between low spermidine and violent crime presents at least the possibility of a causal relationship with the potential of altering antisocial behavior by manipulating the level of a normally occurring body chemical.

CONCLUSIONS

- 1) Morris County Jail inmates were found to have abnormal levels of blood polyamines.
 - a) Inmate average blood levels of spermidine were significantly lower than normal blood levels; inmates having the lowest blood spermidine levels have committed significantly more violent crimes than inmates having normal blood spermidine levels.
 - b) Inmate average blood levels of spermine were significantly lower than normal blood levels. Low spermine is one of several indications of relative hypoglycemia noted in the Morris County Jail inmates. In theory, dietary rehabilitation to correct hypoglycemia may also correct criminal behavior in some cases.
 - c) Inmates had a broad range in blood levels of histamine, approaching the histamine range found in schizophrenics.
- 2) More research is needed to investigate the role of polyamines, diet, and behavior.

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