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Relationship between Thyroid Hormone Levels and Crime Type: A Controlled Study in Prisoners

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Introduction:

Various factors cause aggression, which can be related to hormone imbalance T3 and T4, which can act as neurotransmitters are reported to be elevated during aggression. Moreover mental and behavioural disorders possibly occur in individuals with impairment in thyroid hormone balance.

Goitre is a common endemic disease in the Mediterranean region. Studies have reported that one out of every five people in Turkey has goitre and around 0.1% of them have toxic goitre.

Owing to toxic goitre, there is also the risk of severe mental and social issues. The main rationale for this study was to assess if high T3, high T4, and low TSH hormones could have an effect on aggression-related crime tendency. Hence, we investigated the association of thyroid hormone levels, pulse rate, TSH, T3/T4 ratio and presence of toxic goitre with crime type in prisoners.

Materials and Methods:

Our study was conducted in Closed Prisons, Ankara Sincan. The study group consisted of 208 male volunteers who were imprisoned and the control group had 82 male volunteers who had not been imprisoned. Blood samples were collected from individuals of both groups, and T3, T4 and TSH levels and T3/T4 ratios were measured.

Toxic goitre examinations and pulse rate measurements were also performed. Then the prisoners in the study group were further divided into two subgroups: Group A (n=96), consisting of prisoners convicted of aggression-related crimes, and Group B (n=112); consisting of prisoners convicted of crimes of other types that are not related to aggression. After the results were compared between the groups and evaluated statistically, toxic goitre cases(Group D) identified in Group A were sub-grouped (Group C). Pulse rate, T3,T4 and

TSH levels and T3/T4 ratios were compared between Group B and Group cont. and analysed statistically.

Additionally, we compared Group cont. vs Group A, Group cont. vs GroupB, Group cont. vs Group C, Group cont. vs Group D, Group C vs Group B and Group A vs Group B for these variables.

Results:

All variables showed significant differences when comparing Group A and Group cont.,. Only pulse rate and TSH levels showed significance when comparing Group B and Group Cont.,. There were no significant differences between T3, T4 and T3/T4 levels.

The pulse rate, T3 and T4 showed significant difference when compared to groups A and B, but there was no significant difference in TSH levels between groups A and B. When control and group D were compared, all values showed significant differences. When Group C and B were compared, there were no significant differences for any of the variable. When Group C and Group Cont. were compared, all variables showed significant difference.

With chi-square Fisher exact tests, we obtained a p-value of 0.02 when comparing groups A and B and a p-value of 0.06 when comparing Group A and the control group. Therefore, there was a significant difference between Group A and control group for toxic goitre cases at the $p \leq 0.05$ significance level but not for Group B and the control group.

When the study group was subdivided into aggression-related offenders (Group A) and offenders convicted of other crimes (Group B), toxic goitre rates, T3, T4, pulse rates and T3/T4 ratio values were found to be significantly higher in Group A than in the control group.

Only pulse rates were found to be statistically higher in group B prisoners than those in controls, and TSH values were found to be lower than those in control group.

According to these results, presence of toxic goitre and high T3, T4 and T3/T4 ratio values were associated with increased tendency for aggression-related crime but did not show association with non-aggression crime.

TSH values were found to be significantly lower and pulse rates significantly higher in all study groups than in controls.

According to these results, an increase in pulse rates may indicate a crime-prone personality, when other variables such as heart disease and anaemia are ruled out.

While the difference in pulse rates between group B and control group was statistically significant, there was no significant difference in the thyroid hormone levels between these groups.

According to these findings, an elevated pulse rate is associated with violent crime independently of thyroid hormone values.

In our study, although there was an increase in both T3 and T4 values in individuals with toxic goitre in Group D, T3/T4 ratios were found to be significantly higher than those in the control group. According to the results of our study, T4 values were also significantly higher in Groups A, C and D than in the control group.

The common feature of A, C, and D groups is that they all committed crimes related to aggression. T4 values in group B that committed non-aggression-related crimes were found to be meaningless compared with control group. T3 and T4 values of those in Group C (after exclusion of toxic goitre cases) were compared with those of the control group. The differences were statistically significant.

Discussion:

According to the results of our study, high T3 and T4 values are also associated with the tendency to commit aggression-related crimes.

Higher crime rates related to aggression in patients with toxic goiter are important in terms of forensic psychiatry. If results are obtained in similar studies, as with alcoholics or drug addicts, toxic goiter patients may be exempted from punishment.

Conclusions:

According to the results of our study, toxic goitre and high levels of T3 and T4 hormones may increase the tendency for aggression-related crimes in humans. We propose that the effect of antithyroid therapy on the prevention of aggression-related crimes should be investigated in toxic goiter cases.