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Parametric regression and correlation studies of amyl nitrite induced hemoglobin oxidation of diabetics and non-diabetics blood

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Abstract

Data obtained from 40 donors, 20 of whom were diabetics and 20 of whom were nondiabetics, revealed enhanced susceptibility to oxidation to methemoglobin in the Type 2 diabetics blood compared to the control group ($P<0.05$). The HbA1C percentages of the diabetics blood averaged 11.4 ± 1.2%, while that of the nondiabetics blood averaged 5.5 ± 0.2%. The mean oxidation time of the diabetics blood was 1.5 ± 0.2 min whereas the mean oxidation times of the nondiabetics blood was 3.1 ± 0.5 min. A linear regression line was calculated from the percent of all donor HbA1C values and their hemoglobin oxidation times.

The resultant equation of the straight line was $Y = 4.42 - 0.25X$ where X = HbA1C percentage and Y = hemoglobin oxidation time in minutes. The SD of points around the fitted line was 0.465 and the standard errors of the slope and intercept were 0.0238 and 2.945, respectively. Pearson's coefficient of correlation (r) was found to be - 0.86 which means that there is a very good to excellent inverse relationship between HbA1C percentage and the hemoglobin oxidation time. Thus, this study demostrates that not only is susceptibility of blood oxidation by amyl nitrite enhanced in Type 2 diabetes but that the hemoglobin oxidation times can be predicted by the equation $Y = 4.42 - 0.25X$ with $r = -0.86$ based solely on the pecentage of HbA1C.

Biography

John Philip Tarburton has completed his Ph.D at the age of 25 years from the University of Nebraska and also did postdoctoral studies at the University of Nebraska. Dr. Tarburtion is an Assistant Professor at National University, the second-largest private nonprofit institution of higher learning in California and the twelfth largest in the United States. Dr. Tarburton has published more than 25 papers and abstacts in reputed journals and a book chapter about his research findings.