The Effect of Alcohol on Pancreatic Blood Flow.

An Experimental Study.

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DECLARATION:

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ABSTRACT:

The reference sample method using 15 micron diameter radionuclide labelled carbon microspheres was used to establish a rat model of pancreatic blood flow which was then used to follow up previously reported studies in dogs which showed that intravenously administered alcohol lead to a fall in pancreatic blood flow. In addition, the oral administration of alcohol alone and in combination with glucose was studied.

The literature regarding pancreatic blood flow was reviewed with special emphasis on techniques of measurement and the effect of intravenously administered alcohol.

While the rat model proved highly successful, it was not possible to use a dual injection technique as had been previously carried out in the larger experimental animal. This meant that instead of carrying out a control measurement on each animal it was necessary to have separate control and experiment groups.

The major findings of the study were of difference in pancreatic blood flow between fasted (105 ± 9, mean ± s.e.) and non-fasted animals (134 ± 11) which was significant at the 0.025 level using the unpaired t test ($t=2.14$, df 18, $p<0.025$). No significant changes in pancreatic blood flow were observed with alcohol administered via intravenous or via gastric infusion compared to control groups.

The major finding of the study was that a combination of alcohol and glucose administered via gastric infusion was found to produce a rise in pancreatic blood flow (161 ±19) which was greater than that seen with either intravenous alcohol alone

(111 ± 9) or glucose alone (90 ± 6). This change was highly significant (t=2.70, df 10, $p<0.0125$).

It is concluded that the rat is a suitable experimental model for studying pancreatic blood flow with the microsphere method, that fasting significantly lowers pancreatic blood flow, and that the combination of alcohol and glucose is a potent stimulator of pancreatic blood flow.

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