

## **Cardiac Structural And Functional Changes In AIDS And Cocaine**

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Cardiac dysfunction and cardiomyopathy are important complications of AIDS. It is also known that serious consequences of cocaine abuse include sudden death and congestive heart failure. An additive effect of cocaine on AIDS related heart disease was subsequently hypothesized. Pathophysiological events in AIDS with cocaine coadministration were investigated using transgenic mice (TGs, N = 17) that harbor replication-incompetent HIV-1 (NL4-3? gag/pol). TGs and wild type (WTs, N = 10) mice received a constant infusion of cocaine (40mg/kg/d) or saline by osmotic minipumps for 2 weeks. Animals were then echocardiographed and tissues harvested. In treated TGs, histological analysis of myocardium revealed a significant increase in fibrosis and contraction band necrosis compared to untreated WTs and TGs ( $p < 0.05$ ). Fibrosis and contraction band necrosis was also greater in the treated TGs compared to the treated WTs ( $p < 0.05$ ). Echocardiography, however, revealed no significant differences in either left ventricular mass or fractional shortening. Similarly, a significant difference was not detected in ventricular  $\beta$ -adrenergic receptor abundance (by Dr. Stuart Green). Despite a lack of these physiological findings, significant pathological changes such as increased fibrosis and contraction band necrosis occurred in mice treated with cocaine (40 mg/kg/d). Therefore, further investigation of cardiac hypertrophy and  $\beta$ -adrenergic receptor abundance with increased sample size is warranted.

### **Bibliography**

Karch SB and Billingham ME. The pathology and etiology of cocaine induced heart disease. Arch Path Lab Med 1988; 112:225-230.  
Lewis W. Pathologic changes in the hearts of patients with AIDS. in Cardiology in AIDS, SE Lipshultz, editor; 1988a; Chapman & Hall, New York; pp 233-254.