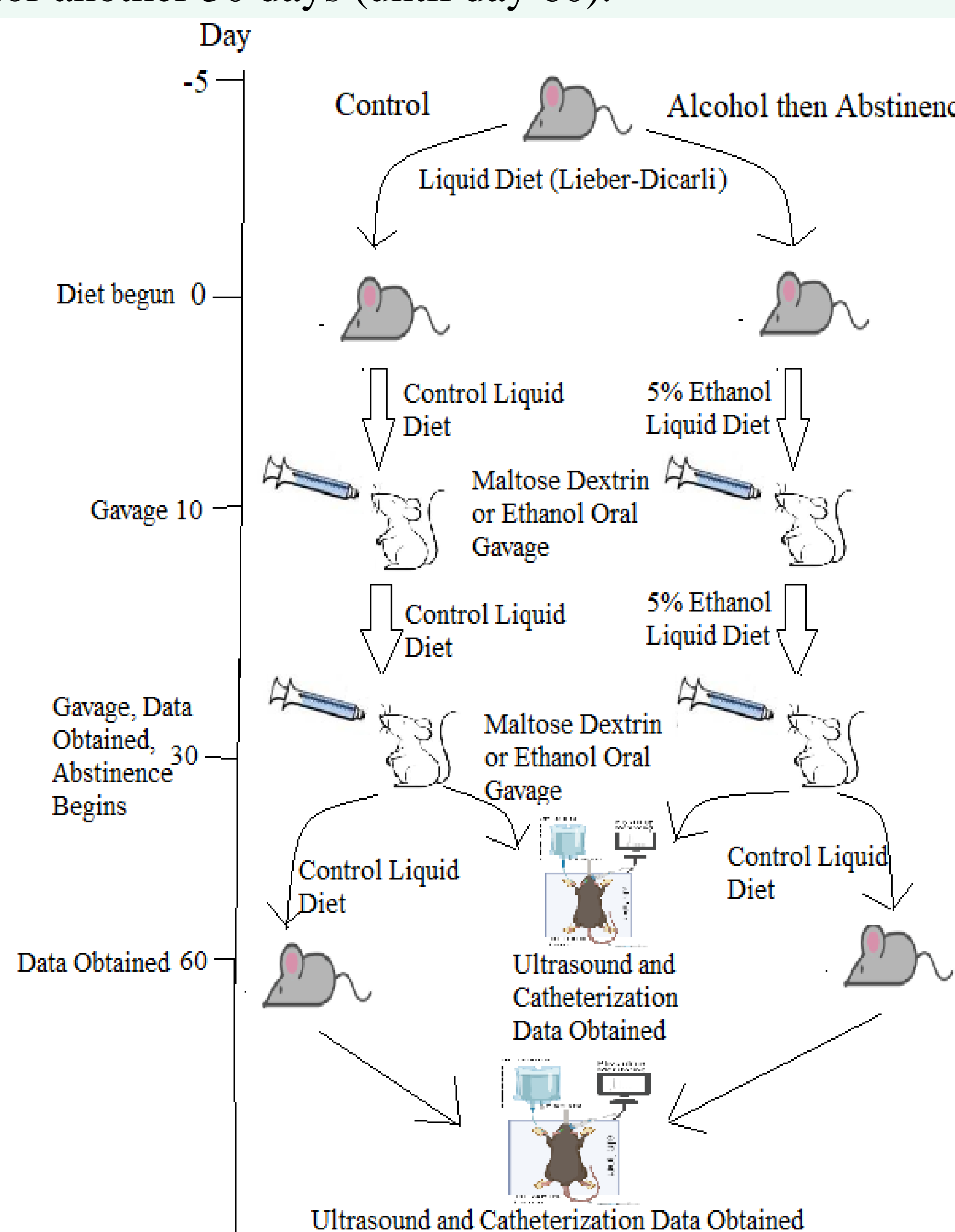


## Introduction

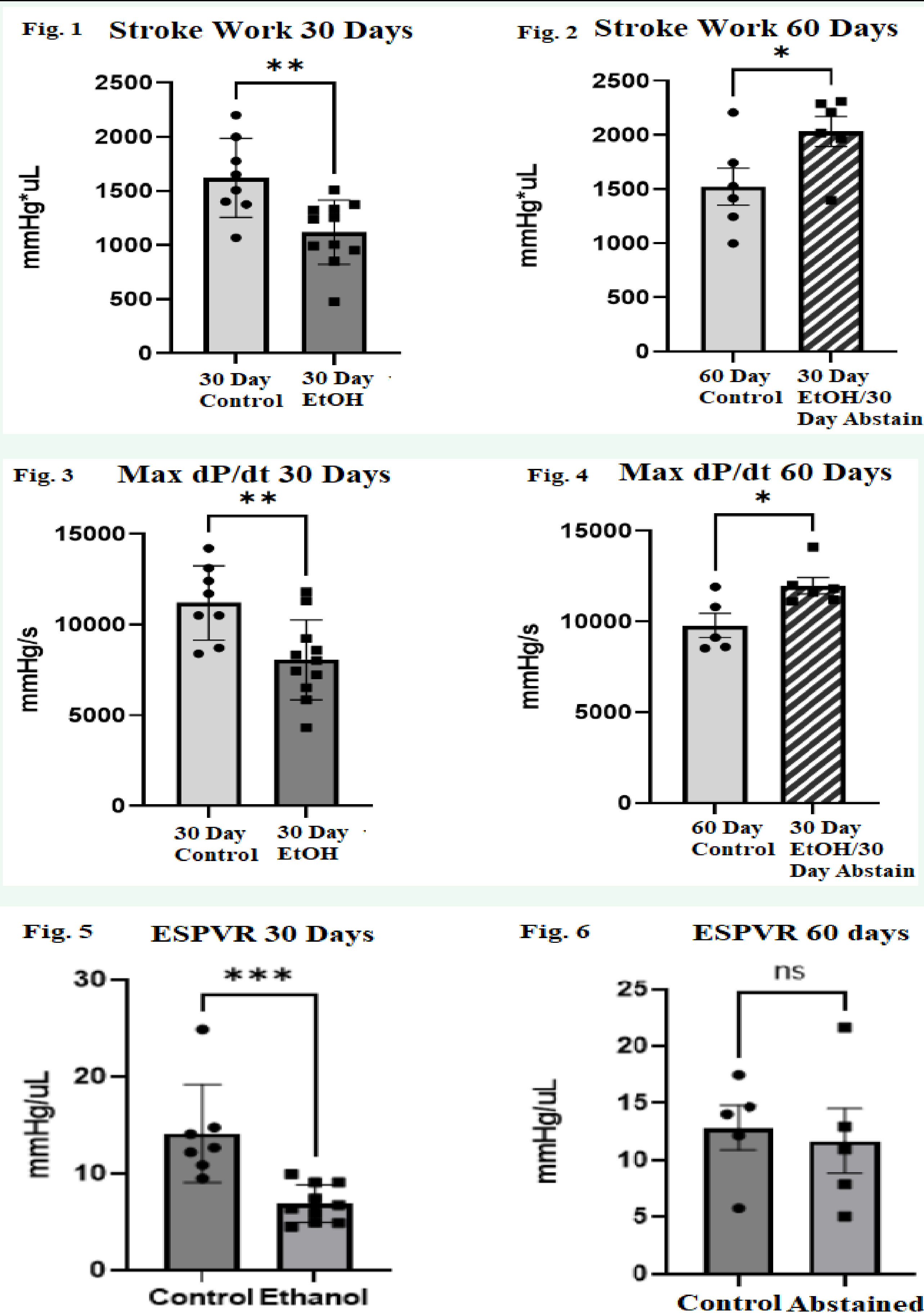
**Alcohol-related cardiomyopathy (ACM)** resulting from chronic alcohol intake and binge drinking is known to be associated with **negative effects** on cardiomyocyte **contractility**, worsened systolic and vascular indices, and cardiac fibrosis, among other parameters. However, the effects of **abstinence** following cessation of alcohol intake are **unclear**. Our **aim** was to determine if alcohol **abstinence** could **restore cardiac function** in mice with established ACM.

## Experimental Design

To observe the effects of alcohol abstinence on cardiac function we used an established mouse model for inducing ACM. This ACM model causes impaired systolic function in the mice after a 30-day regimen of alcohol diet, after which functional data can be obtained from the mice by means of echocardiography and catheterization of the left ventricle (LV). The alcohol diet mice were then placed back on control diet for another 30 days (until day 60).



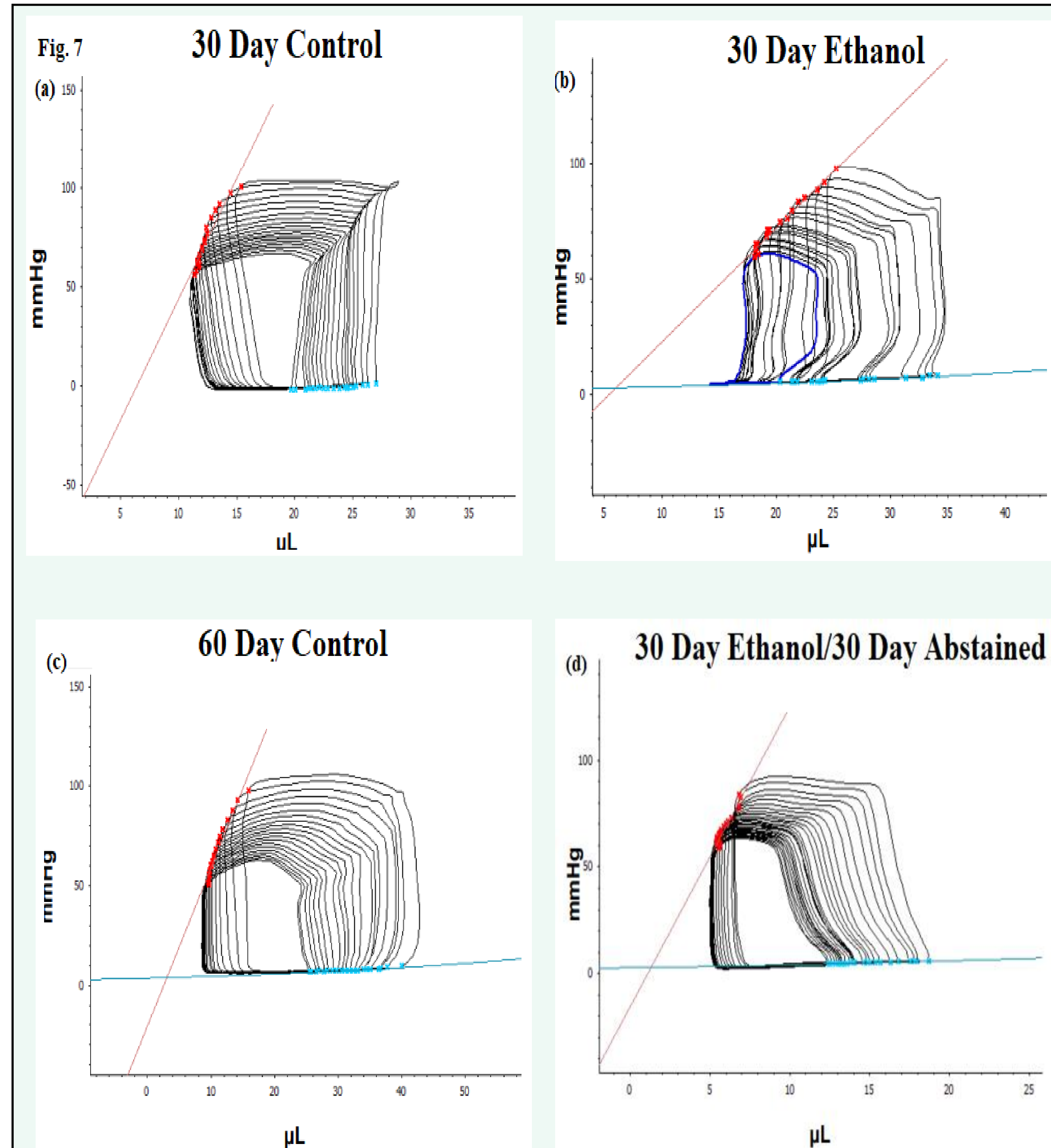
## Stroke Work, LV dP/dt, and ESPVR



Cardiac Function Indices and P-values	Control Day 30	Alcohol Day 30 (Alcohol Diet Complete)	Alcohol Day 60 (Abstinence Complete)
Stroke Work (mmHg* $\mu$ L)	1622 $\pm$ 129	1119 $\pm$ 89 (p<0.05 vs control)	2032 $\pm$ 129 (p<0.05 vs Alcohol Day 30)
Maximum LV dP/dt (mmHg/s)	11188 $\pm$ 724	8054 $\pm$ 665 (p<0.05 vs control)	11967 $\pm$ 449 (p<0.05 vs Alcohol Day 30)

Data for stroke work, maximum LV dP/dt, and end-systolic pressure-volume relationship (ESPVR), all of which are indicators of myocardial contractility. Data obtained using LV catheterization. Statistical analyses were performed using Student's t-test, where p<0.05 is considered significant. **Figures 1 and 2:** Stroke work  $\pm$  SEM of control and ethanol diet mice at 30 days, and control and abstinence mice at 60 days. **Figures 3 and 4:** Maximum left ventricular dP/dt  $\pm$  SEM of control and ethanol diet mice at 30 days, and control and abstinence mice after 60 days. **Figures 5 and 6:** ESPVR  $\pm$  SEM of control and ethanol diet mice at 30 days, and control and abstinence mice after 60 days.

## Pressure-Volume Loops



**Figure 7:** Representative pressure-volume (PV) loops for (a) the 30-day control cohort, (b) the 30-day ethanol cohort, (c) the control cohort at 60 days, and (d) the ethanol cohort after 30 days ethanol diet followed by 30 days of abstinence. The red lines in each PV loop represent ESPVR. A greater slope indicates greater contractility. It can therefore be visualized that the 30-day ethanol cohort in figure 7b had markedly impaired contractility, but after 30 days of abstinence (figure 7d), contractility had improved and become similar to that of mice on control diet at 60 days (7c), as indicated by the relative magnitude of the slopes (ESPVRs) in each PV loop.

## Conclusion

Our data indicated improvements in stroke work, LV dP/dt, and ESPVR in the alcohol group following cessation of alcohol intake. These findings indicate that abstinence following chronic alcohol intake and binge drinking can improve cardiac function, with our data indicating a pronounced improvement in myocardial contractility.