Abstract: Purpose. We studied the relationship between minute distance calculated from pulmonary venous flow (PVF) velocity tracing and cardiac output (CO) measured with thermodilution method in patients undergoing cardiovascular surgery.
Methods. In 32 patients undergoing cardiovascular surgery, simultaneous measurements of hemodynamics including CO and transesophageal pulsed Doppler signals of PVF velocity were performed before and after surgical repair. Minute distance was calculated as the product of the heart rate and the sum of time-velocity integrals of PVF.
Results. The minute distance after surgical intervention increased from $1121 \pm 347$ cm·sec$^{-1}$ to $1764 \pm 538$ cm·sec$^{-1}$ ($p<0.001$; mean $\pm$ SD), while CO increased after surgical intervention from $3.5 \pm 0.9$ L·min$^{-1}$ to $5.3 \pm 1.1$ L·min$^{-1}$. Simple linear regression analysis showed that minute distance was related with CO before and after surgical intervention ($r=0.81$ and $r=0.76$, respectively). The changes in minute distance were also related with those in CO ($r=0.80$).
Conclusion. The present study demonstrated that minute distance obtained from the pulsed Doppler tracings of PVF velocity was related with CO during cardiovascular surgery in adults. These results suggest that the changes in CO could be estimated from minute distance in pulmonary vein. J. Med. Invest. 52: 178-185, August, 2005
Keywords: pulmonary blood flow, cardiac output, transesophageal echocardiography
Measurement of pulmonary venous flow velocity and cardiac output
Experimental protocol

The experimental protocol was a comprehensive analysis of the PV flow velocity and cardiac output, as well as the statistical analysis of the data obtained from the study. The protocol involved the measurement of various parameters related to the PV flow velocity and cardiac output using advanced techniques and equipment.

Statistical analysis

The statistical analysis of the data obtained from the experimental protocol was performed using advanced statistical software and methods. The analysis included the calculation of various statistical measures, such as mean, median, standard deviation, and significance tests, to determine the significance of the results obtained from the study.
(A) \[ y = 2.1 \times 10^{-3} + 1.14 \]
\[ r = 0.81 \]
\[ p < 0.0001 \]
\[ n = 32 \]

(B) \[ y = 1.6 \times 10^{-3} + 2.50 \]
\[ r = 0.76 \]
\[ p < 0.0001 \]
\[ n = 32 \]