Has intrathecal fentanyl no effects during arm exercise?

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TO THE EDITOR: Amann et al. (1) tested a fine and worthwhile hypothesis, but their results may raise more questions than are answered.

They show that intrathecal fentanyl produced a small reduction in minute ventilation and significantly raised $\text{PETCO}_2$ during 100–325 W leg exercise. They propose that since $\text{PETCO}_2$ rose, this masked a further fentanyl-induced fall in minute ventilation. They quantify this further fall by applying a novel calculation on minute ventilation using the measured CO2 sensitivity value from the same subjects at rest. Three points could be considered further.

1) Publications show CO2 sensitivity during exercise either increasing, not changing, or decreasing vs. that measured at rest. The METHODS section does not mention any CO2 sensitivity measurements made during exercise. Do they have any data measuring CO2 sensitivity during exercise in these same subjects? If not, what is the justification in their novel calculation of choosing to apply the resting CO2 sensitivity value to breathing during exercise?

2) Might the significant PETCO2 rise during both leg (Fig. 2E) and arm exercise (Table 3) after intrathecal fentanyl indicate that intrathecal fentanyl does produce a decrease in CO2 sensitivity that is detectable during exercise but undetectable at rest (except in the 2 additional subjects that were then excluded)?

3) If this novel calculation is valid, surely it is equally valid to apply it on minute ventilation during the significant PETCO2 rise found during 50 and 75 W arm exercise? The numerical results of deliberately applying it during arm exercise could then be given greater consideration in their debate on whether fentanyl has any apparently central effects.

DISCLOSURES

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REFERENCE