sult from altered membrane dimensions—then the pressure reversal of barbiturate-induced narcosis might indicate a similarity in sites or mechanisms of action of inhalation and barbiturate anesthetics.

Our study demonstrates that 103-atm helium pressure does reverse phenobarbital anesthesia in mice. Furthermore, the degree of antagonism, represented by the 64 per cent increase in ED_{50}, produced by pressure is of the same magnitude as that seen with gaseous anesthetics. This offers further support to a similar mechanism of action. However, the lack of parallelism between the 1-atm and 103-atm dose–response curves raises the question whether, despite the uniequivocal antagonism of barbiturate anesthesia by pressure, this interaction may not be exclusively "competitive" at the anesthetic site of action and may even involve an indirect and general central nervous system stimulation.

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References

1. Johnson FH, Flagler EA: Hydrostatic pressure reversal of narcosis in tadpoles. Science 112: 91–92, 1950
2. Eger EI II: Anesthetic Uptake and Action. Baltimore, Williams and Wilkins, 1974
3. Miller KW, Paton WDM, Smith EB: The anesthetic pressures of certain fluorine containing gasses. Br J Anaesth 39:910–918, 1967
4. Brauer RW, Beaver RW: Rate factors in development of the high pressure neurological syndrome. J Appl Physiol 38:220–227, 1975
5. Waud DR: On biological assays involving quantal responses. J Pharmacol Exp Ther 183: 577–607, 1972
6. Brauer RW: Seeking man's depth level. Ocean Indust 3:28–33, 1968
7. Bennett PB, Towse EJ: Performance efficiency of men breathing oxygen–helium at depths between 100 feet and 1500 feet. Aerosp Med 42:1147–1156, 1971
8. Miller KW: Inert gas narcosis, the high pressure neurological syndrome and the critical volume hypothesis. Science 185:867–869, 1974
9. Lever MJ, Miller KW, Paton WDM, et al: Effects of hydrostatic pressure on mammals. Proceedings of the 4th Symposium on Underwater Physiology. Edited by CJ Lambertson. New York, Academic Press, 1971, pp 487–500

Transfusion

AUTOLOGOUS TRANSFUSION AND CARDIOPULMONARY BYPASS Will autologous transfusion for open-heart surgery reduce demands on the blood bank? This question was examined in 122 patients more than 10 years old undergoing elective open-heart surgery. In every other patient, approximately 30 per cent of the patient's blood volume was removed prior to institution of cardiopulmonary bypass. The blood was restored after the end of bypass. The other half of the patients served as controls and received only banked blood. Both groups were divided into cyanotic and acyanotic patients. After cardiopulmonary bypass had been terminated, acyanotic control patients received 2.3 ± 2.5 (mean ± SD) units of banked blood. The acyanotic autologous-transfusion group received only 0.4 ± 0.9 units each. Post-bypass requirements for blood were significantly less in the acyanotic autologous-transfusion group. In the cyanotic patients blood requirements in the two groups were equal. However, removal of autologous blood frequently caused decreased venous return during bypass, resulting in additional transfusion of the pump oxygenator with whole blood and crystalloid. Thus, more blood was actually administered in the autotransfusion group than in the control group, a difference that was significant in the cyanotic patients. Platelet and fresh-frozen plasma utilizations were the same in the two groups. (*Plian MB, McGoon DC, Tarhan S: Failure of transfusion of autologous whole-blood to reduce banked blood requirement in open-heart surgical patients. J Thorac Cardiovasc Surg 70:228–343, 1975.*)

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