

Effect of Mecloqualone on the Oxygen and Glucose Uptake by Brain Tissue in vitro

Mecloqualone is a hypnotic drug from the 2,3-substituted quinazalone group, which was introduced by GUJRAL et al.^{1,2}. Mecloqualone is twice as active but not more toxic than Methaqualone, the latter being the most studied drug from that group³⁻⁵. Our paper deals with the effect of Mecloqualone on the oxygen and glucose utilization by brain tissue in vitro.

oxygen utilization by brain slices and brain homogenates, but it can be seen in Table I that the inhibition is roughly the same at potassium concentrations of 5 mM and 100 mM.

Table I shows also that glucose uptake by the tissue is enhanced in the presence of the drug, but this effect is only apparent at the lowest potassium concentration.

Table I. Effect of Mecloqualone on oxygen and glucose uptake by brain slices

Drug concentration	Potassium concentration	Oxygen (μ l/100 mg wet tissue/h)	Glucose (mg/100 mg wet tissue/h)
Control	5 mM	71.40 \pm 4.31 (10)	0.72 \pm 0.06 (10)
	100 mM	81.43 \pm 2.97 (18)	1.21 \pm 0.08 (12)
1 \times 10 ⁻³ M	5 mM	47.10 \pm 5.70 (8) ^b	1.06 \pm 0.11 (8) ^a
	100 mM	59.95 \pm 2.93 (8) ^c	1.07 \pm 0.04 (12)
1 \times 10 ⁻⁴ M	5 mM	44.60 \pm 3.12 (8) ^b	0.96 \pm 0.12 (8)
	100 mM	75.66 \pm 5.63 (8)	1.09 \pm 0.07 (12)

^a $P < 0.02$; ^b $P < 0.01$; ^c $P < 0.001$. The figures are means \pm S.E.M. In brackets the number of slices.

Table II. Effect of Mecloqualone on oxygen utilization by brain homogenates

Drug concentration	No. of experiments	Oxygen uptake (μ l/100 mg wet tissue/h)
Control	21	72.64 \pm 2.46
1 \times 10 ⁻³ M	8	56.47 \pm 5.67 ^a
1 \times 10 ⁻⁴ M	8	65.88 \pm 1.95

^a $P < 0.01$. The figures are means \pm S.E.M.

Resumen. La mecloqualona inhibe in vitro, la respiración de cortes y homogenizados de cerebro, incrementando el consumo de glucosa; este último efecto no se produce cuando al medio de incubación se añaden 100 mM de potasio.

A. VELASCO MARTÍN, J. M. ARÉVALO ALONSO
and M. DE ARMIJO VALENZUELA

Department of Pharmacology and Medical Hydrology,
Medical School Ciudad Universitaria,
Madrid 3 (Spain), 3 January 1972

Material and methods. Adult male albino rats were used to prepare brain slices, as described by McILWAIN and BUDDLE⁶, and brain homogenates. The slices were incubated in Krebs-Ringer phosphate medium (pH 7.4), which contained glucose (10 mM) and 5 mM or 100 mM potassium. Whole brain homogenates were prepared in 0.25 M sucrose, 0.1 M phosphate buffer (pH 7.4). Oxygen utilization was determined by the manometric technique of Warburg⁷, and glucose uptake was estimated by measuring the glucose concentration in the medium at the end of incubation with a glucose oxidase method⁸.

Results and discussion. It is known that some central nervous system depressors inhibit oxygen uptake by the brain tissue (QUASTEL⁹, McILWAIN¹⁰) and this effect is more evident when the tissue respiration has been stimulated by a high potassium concentration in the medium (GHOSH and QUASTEL¹¹, TAMARIT¹²). The data of Tables I and II show that Mecloqualone inhibits

¹ M. L. GUJRA and R. L. KOHLI, J. Ass. Physns India 2, 29 (1955).

² M. L. GUJRAL, R. L. KOHLI and P. N. SAXENA, Ind. J. med. Sci. 10, 871 (1956).

³ J. R. BOISIER and J. PAGNY, Medna exp. 1, 368 (1959).

⁴ T. W. PARSONS and T. J. THONSON, Br. med. J. 7, 171 (1961).

⁵ J. G. SWIFT, E. DICKENS and B. A. BECKER, Arch. int. Pharmacodyn. 128, 112 (1960).

⁶ H. McILWAIN and H. L. BUDDLE, Biochem. J. 53, 412 (1953).

⁷ W. W. UMBREIT, R. H. BURRIS and J. F. STAUFFER, *Manometric Techniques*, (Burgess Publishing Co. Minneapolis 1959).

⁸ A. SOLS and G. DE LA FUENTE, Revta esp. Fisiol. 13, 231 (1957).

⁹ J. H. QUASTEL, Physiol. Rev. 19, 135 (1939).

¹⁰ H. McILWAIN, *Biochemistry and the Nervous System* 2edn Ed (J. and A. Churchill, Ltd, London 1959).

¹¹ J. J. GHOSH and J. H. QUASTEL, Nature, Lond. 174, 28 (1954).

¹² J. TAMARIT, Actas V Reunión Nacional Soc. Esp. Ciencias Fisiológicas, pag. 303 (1959).

Storing of Secretory Material Inside the Perinuclear Space

Conspicuous dilatations and inclusions of the rough endoplasmic reticulum (RER) are known from many types of cells. Only a few papers report on dilatations of

the perinuclear space (PS). WILLIAMS and JEW¹ observed pockets between the inner and outer nuclear membranes in fibroblasts surrounding the sympathetic ganglia of