

EFFECTS OF BROMSULFTHALEIN ON THE OSMOTIC RESISTANCE OF HUMAN RED BLOOD CELLS

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Bromsulfthalein (BSP) is a diagnostic agent used to assess liver function, and its concentration in bile may vary under certain pathological conditions. Studies have shown that BSP inhibits the volume-sensitive outwardly rectifying (VSOR) chloride channel in HeLa cells and the Maxi-Cl channel in C127 cells, thereby affecting the regulation of cell volume. Considering these properties, our experiments focused on evaluating the potential effects of bromsulfthalein on the stability of human red blood cells exposed to different osmotic stress conditions.

Keywords: *Bromsulfthalein, human red blood cells, osmotic resistance, hemolysis.*

As the osmotic pressure of the medium decreased, red blood cells volume increased, leading to a higher degree of lysis. In the control isotonic solution (290 mOsm/kg H₂O), the extent of hemolysis after 60 minutes was $1.44 \pm 0.1\%$. When the osmotic pressure of the solution was reduced to 40–80 mOsm/kg H₂O, the degree of hemolysis increased to $94.7 \pm 0.1\%$ ($n = 4$). In the control experiments, the osmotic pressure causing 50% hemolysis of erythrocytes (Π_{50}) was determined to be 102.4 ± 5.3 mOsm/kg H₂O. When bromsulfthalein was added to the incubation medium at a maximal concentration of 500 μ M (a non-hemolytic concentration under isotonic conditions), the osmotic pressure causing 50% hemolysis (Π_{50}) was 114.4 ± 4.2 mOsm/kg H₂O ($n = 4$).

The obtained results indicate that bromsulfthalein (BSP) significantly decreased the osmotic resistance of human red blood cells and exerted a promoting effect on the hemolysis process.

REFERENCES

1. [Meri V Seeman.](#) (2021) World History of the dopamine hypothesis of antipsychotic action. J Psychiatry. 19;11(7): 355-364. DOI:[10.5498/wjp.v11.i7.355](#)
2. [M.W. Harrold, Y.A. Chang, R.A. Wallace, T. Farooqui, L.J. Wallace, N. Uretsky, D.D. Miller.](#) (1987) Charged analogues of chlorpromazine as dopamine antagonists. J Med Chem. 1987 Sep;30(9):1631-5. DOI:[10.1021/jm00392a019](#)
3. Eslami Shahrababaki M., Dehnavieh R., Vali L., Sharafkhani R. (2018) [Chlorpromazine versus piperacetazine for schizophrenia.](#) Cochrane Database Syst Rev. 31;10(10):CD011709. doi: 10.1002/14651858
4. Murawiec S. (2003) [Subjective aspects of pharmacotherapy in schizophrenia during implementation of chlorpromazine in Poland-a review.](#) Psychiatr Pol. 37(4):657-67. PMID: 14560494