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Therapeutic Uses of Inorganic Nitrite and Nitrate From the Past to the Future

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DOI <https://doi.org/10.1161/CIRCULATIONAHA.107.753814>

Circulation. 2008;117:2151-2159

Originally published April 21, 2008

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Abstract

Potential carcinogenic effects, blue baby syndrome, and occasional intoxications caused by nitrite, as well as the suspected health risks related to fertilizer overuse, contributed to the negative image that inorganic nitrite and nitrate have had for decades. Recent experimental studies related to the molecular interaction between nitrite and heme proteins in blood and tissues, the potential role of nitrite in hypoxic vasodilatation, and an unexpected protective action of nitrite against ischemia/reperfusion injury, however, paint a different picture and have led to a renewed interest in the physiological and pharmacological properties of nitrite and nitrate. The range of effects reported suggests that these simple oxyanions of nitrogen have a much richer profile of biological actions than hitherto assumed, and several efforts are currently underway to investigate possible beneficial effects in the clinical arena. We provide here a brief historical account of the medical uses of nitrite and nitrate over the centuries that may serve as a basis for a careful reassessment of the health implications of their exposure and intake and may inform investigations into their therapeutic potential in the future.

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