

Supplemental Oxygen During Sickle Crisis

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Our practice recently admitted a 22-year-old woman with known sickle cell disease in acute painful crisis. We traditionally use oxygen as a component to therapy in this situation, but a colleague challenged its usefulness. Although risks associated with oxygen therapy are minimal, many patients find it uncomfortable. What is known about its benefit in sickle cell crises and when is it indicated?

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As you noted, the use of oxygen is almost always a component of the treatment of acute painful crisis in a patient with sickle cell disease. The logical support for this practice is the belief that sickling of red cells is the root cause of the painful crisis, coupled with the knowledge that deoxygenation induces sickling in the test tube. The sickling

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phenomenon is reversible by exposing cells to oxygen, and by inference it has been assumed that oxygen must be good for patients in crisis. Actual data are hard to find. A search of MEDLINE back to 1966 failed to turn up any trial of the benefit of oxygen in a painful crisis. Laszlo et al¹ reported in 1969 that hyperbaric oxygen had little, if any, beneficial effect in acute painful crisis, although there is one case report of successful use of this mode of therapy.² On balance, I believe that the data support the view that hyperbaric oxygenation is not effective in this setting. If hyperbaric oxygen is not effective, then it is extremely difficult to imagine that oxygen administration by face mask or nasal cannulae could have any beneficial effect on the painful crisis.

The use of oxygen as prophylaxis is both rational and to be encouraged in the right setting. The relationship between decreased partial pressure of oxygen and the development of sickle syndromes is well documented. In this context, any patient with sickle hemoglobin and low arterial oxygen tension should be treated with supplemental oxygen.

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1. Laszlo J, Obenour W Jr, Saltzman HA. Effects of hyperbaric oxygenation on sickle syndromes. *South Med J.* 1969;62:453-456.
2. Reynolds JD. Painful sickle cell crisis; successful treatment with hyperbaric oxygen therapy. *JAMA.* 1971;216:1977-1978.