Alternate Method of Oxygen Delivery for Neonatal Use

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Aguiluz L, Hill RK. Alternate method of oxygen delivery for neonatal use. J Hyperbaric Med 1990;5(4):259–261.—Treatment modalities utilized in our hyperbaric medicine department include both monoplace and multiplace systems. The two oxygen delivery systems used in the multiplace chamber are limited to a mask or a hood and neck ring device. Upon the recent admission of an infant to the unit, we became aware of the inadequacy of these delivery systems. As there are no neonatal oxygen delivery devices available for the hyperbaric environment, collaborative discussion between technicians and nurses resulted in the construction of a tubelike mini oxygen tent to meet the patient’s needs.

oxygen, delivery system, infant

Introduction

Treatment modalities utilized in our hyperbaric medicine department include both monoplace and multiplace systems. The two oxygen delivery systems used in the multiplace chamber are limited to a mask or a hood and neck ring device. Upon the recent admission of an infant to the unit, we became aware of the inadequacy of these delivery systems. There are no neonatal oxygen delivery devices available for the hyperbaric environment.

Materials and Methods

Baby G, a 3-mo.-old white male had a compromised skin flap covering a repaired lipomeningocele. Apparent neurologic deficits included paresis of the perineal area, absent plantar grasp, and bilateral club foot deformity.

The patient required PE tube placement and was received postoperative from recovery only after anesthesia clearance was obtained. Because the infant was newly postoperative, emergency equipment was assembled. These included a pediatric intubation kit, pediatric Ambu bag, i.v. start kit, suction equipment, and pediatric-dose emergency medications. Because these emergency devices were more readily accessible in the multiplace unit and a larger work area was available, this chamber was chosen for the patient’s treatment.

Initially using a standard hood and neck ring, we found the appliance inadequate for our needs. The baby had been placed on a 15-min oxygen and 5-min air schedule, causing frequent air breaks that were disturbing to the
patient. Even with the neck ring properly aligned around the baby's midsection to avoid the flap site, movement by the patient could cause the ring to exert pressure on this compromised area. In addition, lying prone on a blanket-cushioned neck ring around the torso was not particularly comfortable.

Through collaborative discussion between technicians and nurses, a tube-like mini oxygen tent was constructed to meet the patient's needs (Fig. 1). The ends of two duke hoods were sealed together, with one pair of inlet and outlet openings plugged. Zippers in each portion of the duke hood were ample to facilitate the insertion and removal of the baby. Air breaks of 5-min duration were accomplished easily by opening the hood's zipper.

All oxygen precautions as in a monoplace dive were taken in preparing the patient for treatment. For Baby G, this included the cleansing of Mycolog creme used for a rash in the perineal area and replacing plastic diapers with 100% cotton washable ones. Any petroleum-based dressing products were removed from the wound area and were replaced with an 8 x 7.5 in. surgipad. Baby G’s pacifier and bottle were allowed in the “mini-mono” chamber as well as an all-cotton blanket for warmth and comfort.

Results

Excellent results were obtained with the use of the mini-mono chamber. Baby G had ample room for movement and rested comfortably with minimal interruption (Fig. 2). The infant underwent flap debridement and revision while completing 28 hyperbaric treatments. The enhanced mini-mono chamber configuration was effective in providing comfort for the baby and easy access for air breaks. Successful lipomeningocele repair was accomplished.

FIG. 1—Tubelike “mini-mono” chamber.
Discussion

Manufacture of a device similar in usage to the mini-mono would be of benefit for the treatment of infants in the hyperbaric environment. For example, two standard sizes could be available to accommodate birth through 5 mos. and 6 through 9 mo. The larger unit would need to be at least one third greater in diameter than the smaller unit and perhaps several inches longer. Additionally, the recommendation of one long vertical zipper for easier access and removal of the infant is suggested.

Our hyperbaric unit welcomed the challenge to formulate a better treatment modality for this interesting and unique patient.