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Management of infants with bronchopulmonary dysplasia in Germany

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Abstract Although official guidelines for diagnosis and treatment of bronchopulmonary dysplasia (BPD) exist in Germany the practice in tertiary care neonatology centres differs considerably. There is no consensus about the appropriate level of oxygen saturation for infants at risk for BPD or infants with established BPD. Targeting oxygen saturation just below 90% in the first weeks and in the lower nineties thereafter seems to be a reasonable approach. Systemic corticosteroids must be used very restrictively because of adverse short- and long-term outcomes. Diuretics, inhaled corticosteroids, and bronchodilators may be used based on a stringent assessment of the individual response; their routine use cannot be recommended. Domiciliary oxygen is a therapy rarely prescribed in Germany although, if carefully planned and organised, it is safe and effective. Infants with home oxygen need a close follow-up by neonatologists and other specialists. Routine vaccination is recommended from the postnatal age of 3 months onwards.

1. Introduction

During the last decade the insights into the pathogenesis of bronchopulmonary dysplasia (BPD) have expanded considerably. There is growing evidence that multiple risk factors induce an injurious inflammatory process in the airways and the pulmonary interstitium of preterm infants [1,2]. Intrauterine exposure to pro-inflammatory cytokines may prime the fetal lung such that minimally injurious events provoke an excessive pulmonary inflammatory response that most certainly affects normal alveolisation and pulmonary vascular development in preterm infants with BPD. Despite our increasing knowledge most of the treatment strategies used in the management of infants with BPD are still not evidence-based. In this article we have attempted to give an overview on the current therapeutic concepts utilized in some neonatal intensive care units in Germany and define—whenever possible—evidence-based strategies.

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2. Definition and epidemiology

Since its first description in 1967 the definition of BPD has been modified several times. In 2000 a National Institute of Child Health and Human Development/National Heart, Lung and Blood Institute/Office of Rare Diseases consensus conference refined the definition [3]. According to this new set of diagnostic criteria premature infants who need supplemental oxygen for at least 28 day suffer from BPD. Depending on the degree of respiratory support at 36 weeks of postmenstrual age or at discharge the disease is classified as mild, moderate or severe. It has been proposed to retain the name BPD instead of the rather unspecific term 'chronic lung disease' [3,4].

Advances in neonatal intensive care have led to improved survival rates of premature infants at risk for BPD. European population-based or centre-based studies revealed that improved survival did not lead to a considerable increase in the incidence of BPD [5,6]. The reported BPD rates largely depend on the definition used by the authors. Since there is no central registry on neonatal pulmonary outcome in Germany we have analysed data from surveys on neonatal quality control in 11 of the 16 federal states of Germany in the year 2001. The paediatric departments in each of the 16 states are obliged to provide standardised information on all hospitalised neonates for these surveys. The presented data are based on a population of almost 70.5 millions with 639,892 live-births including 8059 infants born at less than 32 weeks of gestational age (GA) (Fig. 1). The surveys provide information on BPD defined as chronic oxygen dependency at day 28 of life and on mortality. As expected the mortality decreased dramatically with increasing gestational age. Since the surveys did not differentiate between patients who died until day 28 of life and thereafter the rates of oxygen dependency refer to the numbers of all live-born infants in each group and not to survivors at day 28. This fact most likely explains the slight increase in the rate of chronic oxygen dependency in the group of infants born between 26 and 27 weeks GA when compared with those born at less than 26 weeks. The fact that 29% of all live-births <32 weeks GA were oxygen-dependent at day 28 of life underlines that pulmonary disease is an important component of morbidity in this group with major medical and socioeconomic implications (Fig. 1) [7].

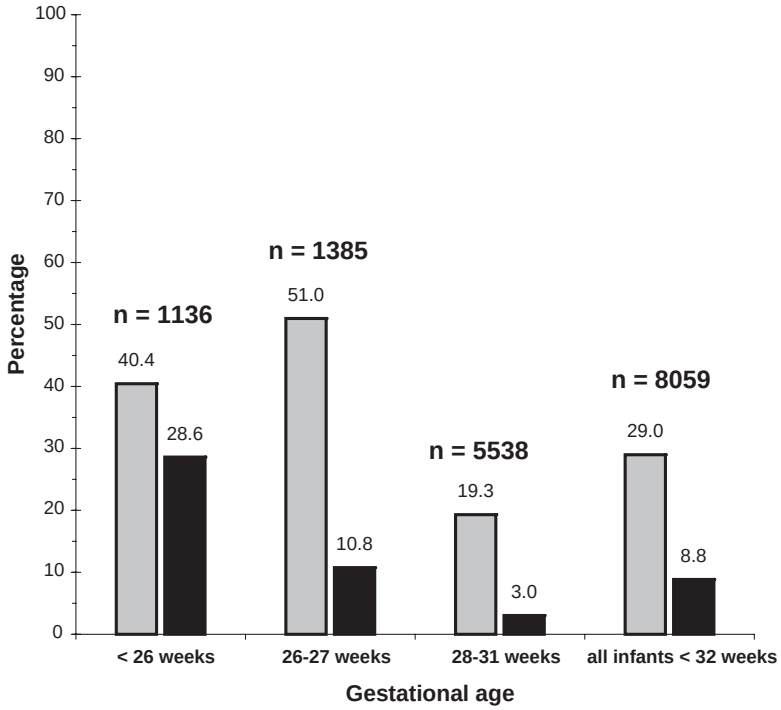

Figure 1 Rate of BPD (shaded bars) and mortality (black bars) of 8059 infants born at less than 32 weeks of gestational age in 11 federal states of Germany in 2001. BPD is defined as oxygen dependency on day 28 of life. Data are derived from the annual obligatory surveys for quality control of neonatal care in the following states: Baden-Wuerttemberg, Bavaria, Berlin, Bremen, Hesse, Mecklenburg-Vorpommern, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland and Saxony.