1. **Early Mobilization of Mechanically Ventilated Patients. A 1-Day Point-Prevalence Study in Germany. Nydalh P et al. Crit. Care Med.**

Abstract

OBJECTIVES:

There is growing evidence to support early mobilization of adult mechanically ventilated patients in ICUs. However, there is little knowledge regarding early mobilization in routine ICU practice. Hence, the interdisciplinary German ICU Network for Early Mobilization undertook a 1-day point-prevalence survey across Germany.

DESIGN:

One-day point-prevalence study.

SETTING:

One hundred sixteen ICUs in Germany in 2011.

PATIENTS:

All adult mechanically ventilated patients.

INTERVENTIONS:

None.

MEASUREMENTS AND MAIN RESULTS:

For a 24-hour period, data were abstracted on hospital and ICU characteristics, the level of patient mobilization and associated barriers, and complications occurring during mobilization. One hundred sixteen participating ICUs provided data for 783 patients. Overall, 185 patients (24%) were mobilized out of bed (i.e., sitting on the edge of the bed or higher level of mobilization). Among patients with an endotracheal tube, tracheostomy, and noninvasive ventilation, 8%, 39%, and 53% were mobilized out of bed, respectively ($p < 0.001$ for difference between three groups). The most common perceived barriers to mobilizing patients out of bed were cardiovascular instability (17%) and deep sedation (15%). Mobilization out of bed versus remaining in bed was not associated with a higher frequency of complications, with no falls or extubations occurring in those mobilized out of bed.

CONCLUSIONS:

In this 1-day point-prevalence study conducted across Germany, only 24% of all mechanically ventilated patients and only 8% of patients with an endotracheal tube were mobilized out of bed as part of routine care. Addressing modifiable barriers for mobilization, such as deep sedation, will be important to increase mobilization in German ICUs.

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2. **Expert consensus and recommendations on safety criteria for active mobilization of mechanically ventilated critically ill adults. Carol L. et al. Crit Care.**

Abstract

INTRODUCTION:

The aim of this study was to develop consensus recommendations on safety parameters for mobilizing adult, mechanically ventilated, intensive care unit (ICU) patients.

METHODS:

A systematic literature review was followed by a meeting of 23 multidisciplinary ICU experts to seek consensus regarding the safe mobilization of mechanically ventilated patients.

RESULTS:

Safety considerations were summarized in four categories: respiratory, cardiovascular, neurological and other. Consensus was achieved on all criteria for safe mobilization, with the exception being levels of vasoactive agents. Intubation via an endotracheal tube was not a contraindication to early mobilization and a fraction of inspired oxygen less than 0.6 with a percutaneous oxygen saturation more than 90% and a respiratory rate less than 30 breaths/minute were considered safe criteria for in- and out-of-bed mobilization if there were no other contraindications. At an international meeting, 94 multidisciplinary ICU clinicians concurred with the proposed recommendations.

CONCLUSION:

Consensus recommendations regarding safety criteria for mobilization of adult, mechanically ventilated patients in the ICU have the potential to guide ICU rehabilitation whilst minimizing the risk of adverse events.

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3. **Physiotherapy in the intensive care unit: an evidence-based, expert driven, practical st atement and rehabilitation recommendations. Sommers J. Et al. Clin. Rehabil.**

Abstract

OBJECTIVE:

To develop evidence-based recommendations for effective and safe diagnostic assessment and intervention strategies for the physiotherapy treatment of patients in intensive care units.

METHODS:

We used the EBRO method, as recommended by the 'Dutch Evidence Based Guideline Development Platform' to develop an 'evidence statement for physiotherapy in the intensive care unit'. This method consists of the identification of clinically relevant questions, followed by a systematic literature search, and summary of the evidence with final recommendations being moderated by feedback from experts.

RESULTS:
Three relevant clinical domains were identified by experts: criteria to initiate treatment; measures to assess patients; evidence for effectiveness of treatments. In a systematic literature search, 129 relevant studies were identified and assessed for methodological quality and classified according to the level of evidence. The final evidence statement consisted of recommendations on eight absolute and four relative contra-indications to mobilization; a core set of nine specific instruments to assess impairments and activity restrictions; and six passive and four active effective interventions, with advice on (a) physiological measures to observe during treatment (with stopping criteria) and (b) what to record after the treatment.

CONCLUSIONS:
These recommendations form a protocol for treating people in an intensive care unit, based on best available evidence in mid-2014.

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4. **Meta-analysis of exercise training on left ventricular ejection fraction in heart failure with reduced efection fraction: A 10-year Update. Tucker WJ, et al.**

Abstract

BACKGROUND:
The role of exercise training modality to attenuate left ventricular (LV) remodeling in heart failure patients with reduced ejection fraction (HFrEF) remains uncertain. The authors performed a systematic review and meta-analysis of published reports on exercise training (moderate-intensity continuous aerobic, high-intensity interval aerobic, and resistance exercise) and LV remodeling in clinically stable HFrEF patients.

METHODS:
We searched MEDLINE, Cochrane Central Registry of Controlled Trials, CINAHL, and PubMed (2007 to 2017) for randomized controlled trials of exercise training on resting LV ejection fraction (EF) and end-diastolic and end-systolic volumes in HFrEF patients.

RESULTS:
18 trials reported LV ejection fraction (LVEF) data, while 8 and 7 trials reported LV end-diastolic and LV end-systolic volumes, respectively. Overall, moderate-intensity continuous training (MICT) significantly increased LVEF (weighted mean difference, WMD = 3.79%; 95% confidence interval, CI, 2.08 to 5.50%) with no change in LV volumes versus control. In trials ≥6 months duration, MICT significantly improved LVEF (WMD = 6.26%; 95% CI 4.39 to 8.13%) while shorter duration (<6 months) trials modestly increased LVEF (WMD = 2.33%; 95% CI 0.84 to 3.82%). High-intensity interval training (HIIT) significantly increased LVEF compared to control (WMD = 3.70%; 95% CI 1.63 to 5.77%) but was not different than MICT (WMD = 3.17%; 95% CI -0.87 to 7.22%). Resistance training performed alone or combined with aerobic training (MICT or HIIT) did not significantly change LVEF.

CONCLUSIONS:
In clinically stable HFrEF patients, MICT is an effective therapy to attenuate LV remodeling with the greatest benefits occurring with long-term (≥6 months) training. HIIT performed for 2 to 3 months is superior to control, but not MICT, for improvement of LVEF.

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5. Techniques manuelles de drainage bronchique des adultes et adolescents: quel niveau de preuve?

Résumé

Introduction
L'objectif de cette revue systématique de la littérature est de dégager le niveau de preuve des techniques de drainage bronchique manuelles les plus utilisées.

Méthode

La recherche bibliographique a été réalisée sur la période de 1995 à 2014 à partir des bases de données : Medline, PEDro, ScienceDirect, Cochrane Library, REEDOC et kinedoc. Les mots clés suivants ont été utilisés : « drainage de posture », « vibrations manuelles », « percussions thoraciques manuelles », « toux dirigée », « augmentation du flux expiratoire », « ELTGOL », « drainage autogène ».

Résultats

Deux cent cinquante-six articles ont été recensés. Après élimination des doublons et lecture des titres et résumés, 63 articles ont été retenus dont 9 revues systématiques. Ce travail souligne l'insuffisance des données scientifiques valables et les difficultés pour pouvoir déterminer les niveaux de preuve des techniques de désencombrement manuel. Celles-ci ont été évaluées principalement avec des patients porteurs de pathologies sécrétrices (mucoviscidose, DDB, BPCO…). Il permet aussi de montrer les limites des critères d'évaluation permettant de mesurer la présence d'un encombrement et donc l'efficacité du désencombrement.

Conclusion

Le tableau synthétique classant les techniques de désencombrement bronchique en fonction de leur mécanisme physique, élaboré lors de la conférence de consensus de 1994, semble être un axe intéressant pour leur évaluation, permettant de regrouper les techniques ayant des mécanismes d'action identiques. Au vu des résultats de cette revue systématique, il apparaît que seul l'ELTGOL, le drainage autogène et l'ACBT reposent sur un niveau de preuve B. Toutes les autres techniques présentent un niveau de preuve inférieur.

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6. Oxigenoterapia continua domiciliaria

Se define como oxigenoterapia el uso terapéutico del oxígeno y consiste en su administración a concentraciones mayores de las que se encuentran en el aire ambiente, con la intención de tratar o prevenir las manifestaciones de la hipoxia. Esta medida terapéutica ha demostrado aumentar la supervivencia en los enfermos con enfermedad pulmonar obstructiva crónica (EPOC) e insuficiencia respiratoria. A pesar de que este concepto se ha extendido por analogía a la insuficiencia respiratoria crónica originada por otras enfermedades respiratorias y no respiratorias, la efectividad de la oxigenoterapia continua no está demostrada en otras entidades. La oxigenoterapia no se ha demostrado efectiva en términos de supervivencia en pacientes con EPOC e hipoxemia moderada. Tampoco hay consenso sobre su empleo durante las desaturaciones nocturnas en EPOC y durante las desaturaciones al esfuerzo. La elección de la fuente de oxígeno se debe realizar por criterios técnicos, de comodidad y adaptabilidad del paciente y de coste. Se debería ajustar el flujo para conseguir una adecuada corrección de la saturación transcutánea de oxihemoglobina.

Abstract

Oxygen therapy is defined as the therapeutic use of oxygen and consists of administering oxygen at higher concentrations than those found in room air, with the aim of treating or preventing hypoxia. This therapeutic intervention has been shown to increase survival in patients with chronic obstructive pulmonary disease (COPD) and respiratory failure. Although this concept has been extended by analogy to chronic respiratory failure caused by respiratory and non-respiratory diseases, continuous oxygen therapy has not been shown to be effective in other disorders. Oxygen therapy has not been shown to improve survival in patients with COPD and moderate hypoxaemia, nor is there consensus regarding its use during nocturnal desaturations in COPD or desaturations caused by effort. The choice of the oxygen source must be made on the basis of criteria such as technical issues, patient comfort and adaptability and cost. Flow must be adjusted to achieve appropriate transcutaneous oxyhaemoglobin saturation correction.

7. Efficacy and safety of pertussis vaccination in pregnacy to prevent whooping cough in early infancy

Abstract

This is a protocol for a Cochrane Review (Intervention). The objectives are as follows:

To assess the efficacy and safety of pertussis vaccination in pregnancy for preventing whooping cough in early infancy.

BACKGROUND

Description of the condition

Pertussis (whooping cough) is a respiratory infection caused by a bacterium, *Bordetella pertussis*, which spreads through droplet transmission (e.g. cough, sneeze) from person to person. Despite being vaccine preventable, whooping cough is one of the least controlled infections affecting all age groups (WHO 2015); the greatest disease burden is reported in early infancy (among both unvaccinated and under-vaccinated infants) and teenagers (Gill 2016; Masseria 2017; Omer 2016). In 2014, there were an estimated 5.1 million cases of whooping cough and 85,900 deaths due to whooping cough globally among infants (the first 12 months of life). More than 80% of cases and 95% of deaths occurred in low- and middle-income countries, where vaccine coverage is low (CDC 2017; Yeung 2017).

Whooping cough incidence in early infancy (first 3 months of life) has reported rates (per 100,000 infants) of 235 in the USA (Masseria 2017), 1368 in Pakistan (Omer 2016), and 4800 in South Africa (Gill 2016). Whooping cough epidemics are cyclical and occur every three to four years (WHO 2015). Deaths and incidence rates associated with whooping cough outbreaks (e.g. California and Canada in 2010, Washington state in 2012, Italy in 2012 and 2014) in early infancy consistently exceeded other affected age groups (CDC 2017; Chiappini 2016; Tan 2015). However, unvaccinated infants do not drive these outbreaks (CDC 2017). Trends may be attributed to factors such as an increasing pool of susceptible individuals in the community (Dangor 2016), genetic changes in the organism (CDC 2017), suboptimal efficacy of acellular vaccines (Acosta 2016), improved surveillance and reporting, or increased sensitivity of diagnostic tools (Vashishtha 2013; Vilajeliu 2015). However, there is inconclusive evidence regarding the factors contributing to resurgence of whooping cough in high-vaccine coverage areas.

Whooping cough is highly contagious; one person with whooping cough can infect up to 17 other susceptible people. People with whooping cough who are untreated can remain contagious for more than three weeks after cough onset (Heininger 2012). Symptoms appear between one and three weeks following infection (CDC 2017; Gabutti 2012). Clinically, whooping cough can manifest with non-specific flu-like symptoms (e.g. cough, runny nose, mild fever) in people with non-severe disease, making early diagnosis difficult. People with severe whooping cough have classical symptoms including audible inspiratory whoop followed by paroxysmal cough and vomiting (CDC

2017; Gill 2016; Heininger 2012; Swamy 2014). Complications in early infancy may include apnoea, seizures, encephalopathy, pneumonia, and death (Van den Biggelaar 2016; Zhang 2014). Antibiotics may ameliorate symptoms when given early (before the paroxysmal stage), but are otherwise unlikely to be helpful (Heininger 2012). Vaccination is reported to be the most cost-effective way to combat whooping cough epidemics (Vilajeliu 2015).

Description of the intervention

Whooping cough vaccination in pregnancy was initiated as an urgent response to outbreaks of disease that occurred after 2010 that resulted in an alarming number of deaths in early infancy in the USA and the UK (Healy 2016; Moro 2015). A World Health Organization (WHO) position paper recommendation advocating whooping cough vaccination in pregnancy indicates the importance of this intervention (WHO 2015). Immunisation of infants against whooping cough is recommended from six completed weeks after birth (WHO 2015). This is because transplacentally transferred maternal immunoglobulins (antibodies) can inhibit vaccine-induced immunity in the infant (Niewiesk 2014). Other prevention strategies including cocooning (vaccinating close contacts and family members of infants against whooping cough) and postpartum vaccination have been ineffective in protecting infants against whooping cough (Gill 2016; Healy 2015; Maertens 2016; Masseria 2017; Swamy 2014; WHO 2015).

Currently, only acellular vaccines (which consist of highly purified individual *B pertussis* components) are administered in pregnancy because they are safer than whole-cell counterparts (which consist of whole killed *B pertussis* organisms) (Vashishtha 2013; WHO 2015). These vaccines are administered as combinations, such as tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) in the USA (ACIP 2013; CDC 2016), or diphtheria toxoid, tetanus toxoid, pertussis toxoid, inactivated polio toxins (dTaP/IPV) in the UK (Public Health England 2016). Tdap pre-licensure clinical trials did not include pregnant women, and Tdap has not been licensed for repeat administration (Moro 2015). Recommendations on the timing of vaccination vary between 16 and 38 weeks gestation. The Joint Committee on Vaccination and Immunisation (JVCI, UK) recommends that women be vaccinated between 16 and 32 weeks gestation (ideally after fetal anomaly scan at 20 weeks) and up to 38 weeks (Public Health England 2016). The Advisory Committee on Immunization Practices (ACIP, USA) recommends Tdap vaccine for all pregnant women between 27 and 36 weeks gestation, irrespective of previous vaccination status (ACIP 2013). Whooping cough vaccination in pregnancy has been effective in reducing up to 91% of whooping cough in infancy (Gkentzi 2017; McMillan 2017; WHO 2015). Whooping cough vaccination in pregnancy has not been associated with adverse pregnancy (e.g. disorders due to high blood pressure or hypertension), fetal (e.g. stillbirths), or birth (e.g. preterm births) outcomes (Gkentzi 2017; McMillan 2017; WHO 2015).

How the intervention might work

Infants are reliant on immunoglobulins passively transferred from their mothers (e.g. transplacentally and through breast milk) up to the time of primary immunisation. Maternal immunoglobulins have a half-life of 42 days (Van Savage 1990), and the concentration may be inadequate to effectively protect infants against whooping cough (Bechini 2012). Whooping cough vaccination in pregnancy can boost maternal immunoglobulins adequately to last through early infancy up to the time of primary immunisation. The maternal immune system produces antibodies in response to vaccine antigens which enter the fetal bloodstream through the placenta, Van Rie 2005, and breast milk (Furuta 2017). Studies report significantly higher concentrations of anti-whooping cough immunoglobulins in infants born to mothers vaccinated during pregnancy compared to infants born to unvaccinated pregnant women (Gall 2011; Gonik 2005; Healy 2004; Healy 2006a; Leuridan 2011).

Although many countries advocate vaccinating pregnant women in the third trimester, citing lower risk of stillbirth (Healy 2006b), this decision is based on theoretical risks, and evidence of increased risk of stillbirth at any time during gestation is largely absent. Vaccination after 38 weeks' pregnancy may not provide passive protection for the infant, but can prevent whooping cough in the pregnant woman, thereby preventing transmission to her infant (Public Health England 2016). However, the exact duration of passive protection against whooping cough is unknown. Studies have suggested protection against whooping cough anywhere between two months and six months (Mooi 2007; Van den Biggelaar 2016).

Why it is important to do this review

Whooping cough is a public health concern and prevalent in low-, middle-, and high-income countries (WHO 2015). Infants face the greatest risk of hospitalisation, morbidity, and mortality due to whooping cough. Infants also have the least timely diagnosis of whooping cough due to non-specific symptoms. Although vaccinations with dTaP/IPV (in the UK) and Tdap (in the USA) have seen successful translation to policy in high-income countries, the commercial costs of vaccines have been a significant barrier for adoption in low- and middle-income countries (Gill 2016). Moreover, there is a lack of global consensus for the timing of vaccination in pregnancy (Eberhardt 2016), serologic correlation of immunity to whooping cough (i.e. correlation between the presence of antibodies and immunity to whooping cough) (Van den Biggelaar 2016), duration of protection offered to infants, or the absolute need to administer vaccinations during pregnancy.

Two recent non-Cochrane reviews assessed whooping cough vaccination during pregnancy and found conclusive evidence on safety and immunogenicity for mothers and infants following pertussis vaccination in pregnancy (Furuta 2017; Gkentzi 2017). However, robust evidence on vaccine efficacy to reduce whooping cough incidence, severe complications, hospitalisations, or mortality due to whooping cough in early infancy is absent (Furuta 2017; Gkentzi 2017).

In consideration of increasing interest in whooping cough vaccination for pregnant women, a comprehensive systematic review is warranted to consolidate evidence and inform consensus on this important issue, which may have implications for vaccination policy on a global scale.

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8. An official American Thoracic Society/European Respiratory Society statement: key concepts and advances in pulmonary rehabilitation

Abstract

BACKGROUND:

Pulmonary rehabilitation is recognized as a core component of the management of individuals with chronic respiratory disease. Since the 2006 American Thoracic Society (ATS)/European Respiratory Society (ERS) Statement on Pulmonary Rehabilitation, there has been considerable growth in our knowledge of its efficacy and scope.

PURPOSE:

The purpose of this Statement is to update the 2006 document, including a new definition of pulmonary rehabilitation and highlighting key concepts and major advances in the field.

METHODS:

A multidisciplinary committee of experts representing the ATS Pulmonary Rehabilitation Assembly and the ERS Scientific Group 01.02, "Rehabilitation and Chronic Care," determined the overall scope of this update through group consensus. Focused literature reviews in key topic areas were conducted by committee members with relevant clinical and scientific expertise. The final content of this Statement was agreed on by all members.

RESULTS:

An updated definition of pulmonary rehabilitation is proposed. New data are presented on the science and application of pulmonary rehabilitation, including its effectiveness in acutely ill individuals with chronic obstructive pulmonary disease, and in individuals with other chronic respiratory diseases. The important role of pulmonary rehabilitation in chronic disease management is highlighted. In addition, the role of health behavior change in optimizing and maintaining benefits is discussed.

CONCLUSIONS:

The considerable growth in the science and application of pulmonary rehabilitation since 2006 adds further support for its efficacy in a wide range of individuals with chronic respiratory disease.