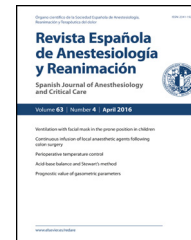




# Revista Española de Anestesiología y Reanimación

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## ORIGINAL ARTICLE

# Procedural difficulties during successful intubation in octogenarians: A prospective observational study<sup>☆</sup>



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### KEYWORDS

Elderly;  
Intubation;  
Process;  
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Oxygenation;  
Ventilation

### Abstract

**Objective:** Octogenarians undergo anatomic and physiopathologic degradation, making airway management problematic, specific to intubation, bag mask ventilation, leading to desaturation and aspiration. Our study's aim was to examine the process of airway management regarding the steps involved in intubation and any deviations or delays in the tasks.

**Materials and methods:** An institutional review board-approved difficult airway prospective observational study in older adults was conducted. Inclusion criteria included airway features indicative of difficult airway, history of failed intubation, the planned use of specialized airway devices, and/or expected airway complications due to comorbidities. Patients 80 years and older were analyzed. Demographic data collected were age, weight, BMI, gender, ASA classification, airway indices, diagnosis, and procedures. Problems with intubation (INT) ( $\geq 3$  intubation attempts), laborious assisted ventilation (VEN) (2-person and/or application of CPAP  $> 20$  cmH<sub>2</sub>O), and complications with oxygenation (OXY) (SpO<sub>2</sub>  $< 95\%$ ) were analyzed.

**Results:** Of the 41 patients enrolled in the study, 3 (7.3%) had all 3: problematic (INT), laborious (VEN), and desaturated (OXY); 8 (19.5%) patients experienced problematic (INT), 20 (48.8%) were described as laborious (VEN), and 14 (34.1%) experienced complications with (OXY).

**Conclusion:** In octogenarians, we found a low incidence of difficulty with INT-VEN-OXY together. However, bag mask ventilation was found to be laborious with a high incidence of desaturation. Success rate of INT as a sole metric may not accurately describe the process of the intubation. We recommend alternative airway devices and techniques and the establishment of protocols for airway management in the elderly.

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**PALABRAS CLAVE**

Personas mayores;  
Intubación;  
Procedimiento;  
Octogenarios;  
Oxigenación;  
Ventilación

## Dificultades de procedimiento durante la intubación exitosa en octogenarios: un estudio prospectivo observacional

**Resumen**

**Objetivo:** Los octogenarios tienen una degradación anatómica y fisiopatológica que deriva en dificultades en el manejo de la vía aérea, específicamente en la intubación y ventilación con la mascarilla facial, que originan desaturación y/o aspiración. El objetivo de nuestro estudio fue examinar el proceso de manejo de la vía aérea con respecto a los pasos involucrados en la intubación, y cualquier desviación o retraso en las tareas.

**Materiales y métodos:** Se realizó un estudio observacional prospectivo de vía aérea difícil en adultos mayores. Los criterios de inclusión incluyeron características de la vía aérea indicativas de vía aérea difícil, historia de intubación fallida, uso planificado de dispositivos especializados en la vía aérea y/o complicaciones previstas de la vía aérea debidas a comorbilidades. Se analizó a los pacientes mayores de 80 años. Los datos demográficos recogidos fueron: edad, peso, IMC, sexo, clasificación ASA, índices de la vía aérea, diagnóstico y procedimientos. Se analizaron los problemas de intubación (INT) ( $\geq 3$  intentos de intubación), ventilación asistida laboriosa (VEN) (2 personas y/o aplicación de CPAP  $> 20$  cmH<sub>2</sub>O) y complicaciones de la oxigenación (OXY) (SpO<sub>2</sub>  $< 95\%$ ).

**Resultados:** De los 41 pacientes incluidos en el estudio, 3 (7,3%) reflejaron los 3 supuestos: problemas (INT), laboriosidad (VEN) y desaturación (OXY); 8 (19,5%) reflejaron problemas (INT), 20 (48,8%) fueron descritos como laboriosos (VEN) y 14 (34,1%) experimentaron complicaciones de oxigenación (OXY).

**Conclusión:** En octogenarios, encontramos una baja incidencia de dificultad de tipo INT-VEN-OXY conjunta. Sin embargo, se encontró que la ventilación con la mascarilla facial era laboriosa, con una alta incidencia de desaturación. La tasa de éxito de INT como única medida puede no describir con precisión el proceso de intubación. Nuestras recomendaciones alternativas son la selección de los dispositivos y las técnicas de vía aérea, y la necesidad de desarrollar protocolos específicos para las personas mayores.

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**Introduction**

Anesthetic and airway management may be challenging in elderly patients, depending on comorbidities and the number of difficult airway indices present.<sup>1</sup> Octogenarians are subject to a number of anatomic, physiopathologic, and cognitive changes that may affect airway management.<sup>2</sup> These include atrophy of the orbicularis oris, edentulous, atrophy of the tongue, presence of oropharyngeal tumor, and rheumatoid arthritis in the neck.<sup>3-5</sup> Additionally, elderly patients also tend to have decreased lung reserves, arterial stiffness, increased risk of GERD, and dementia.<sup>6-8</sup> This may make the task of airway management more problematic in octogenarians with respect to difficult laryngoscopy, which may result in oxygenation desaturation, and the need for higher insufflation pressures during bag mask ventilation (BMV), thereby increasing the risk of aspiration.<sup>2</sup> Therefore, the process of airway management should not be viewed as a single task or endotracheal tube (ETT) placement, but as a whole, including intubation (INT), ventilation (VEN), and oxygenation (OXY), and any deviations from the intended approach.

Though many airway management algorithms and guidelines are available for clinicians, they do not specifically

state how the elderly should be managed.<sup>9,10</sup> Few studies focus specifically on airway management in the elderly; however, some state that intubation success rate is higher in the elderly.<sup>11</sup>

The choice of which airway devices and/or techniques to use depends on the patient's diagnosis and/or comorbidities in terms of the surgical procedure, the airway indices, the extent of anatomic and physiopathologic changes, as well as the prevention of poor outcomes.<sup>12</sup> The key is to choose an airway device that will facilitate intubation and avoid deviating from or delaying the process. The success rate of airway management using intubation as the sole metric does not provide an accurate and/or complete picture of the process of airway management.

Since octogenarians are at greater risk of airway and non-airway complications during airway management, recommendations for the selection of devices and/or techniques should be developed specifically for the elderly. The goal of this study was to present a holistic view of airway management in octogenarians by examining the procedure and describing the sequential steps involved in intubation, including ventilation and the avoidance of desaturation, along with other non-airway complications.

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