**Online Supplement**

**Detection and diagnosis of large airway collapse: A systematic review**

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**e-Table 1. Search strategy**

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| --- |
| Pubmed  |
| 1. "airway collapse"[TIAB] OR "airway collapsibility"[TIAB] OR "bronchial collapse"[TIAB] OR "bronchial collapsibility"[TIAB] OR "tracheal collapse"[TIAB] OR "tracheal collapsibility"[TIAB] OR "expiratory collapse"[TIAB] OR "expiratory tracheal narrowing"[TIAB] OR TM[TIAB] OR tracheobronchomalacia[TIAB] OR bronchomalacia[TIAB] 2. (("Tracheobronchomalacia"[Mesh]) OR "Bronchomalacia"[Mesh]) OR "TM"[Mesh] 3. 1 OR 2 4. 3 Filters: Publication date from 1989/01/01 to 2019/12/31; English |
| Embase  |
| 1. 'airway collapse':ab,ti OR 'airway collapsibility':ab,ti OR 'bronchial collapse':ab,ti OR 'bronchial collapsibility':ab,ti OR 'tracheal collapse':ab,ti OR 'tracheal collapsibility':ab,ti OR 'expiratory collapse':ab,tiOR 'expiratory tracheal narrowing':ab,ti OR TM:ab,ti OR tracheobronchomalacia:ab,ti OR bronchomalacia:ab,ti 2. 'airway collapse'/exp OR 'tracheal collapse'/exp OR 'TM'/exp OR 'TM'/exp OR 'tracheobronchomalacia'/exp 3. 1 OR 2 4. 3 AND [1989-2019]/py AND [english]/lim 5. 4 NOT 'nonhuman'/de  |

**e-Table 2. Quality assessment**

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| --- | --- | --- | --- | --- | --- | --- |
| **Study** | **Prospective recruitment** (0: no; 1: yes) | **Sample size justification** (0: no; 1: yes) | **Sample representativeness** (0: recruited at a single centre; 1: recruited at multiple centres; 2: recruited from general populations) | **Risk of selection bias** (0: recruited for suspected large airway collapse; 1: recruited for respiratory symptoms; 2: unselected recruitment; 9: unclear) | **Description of exclusion criteria**(0: no; 1: yes) | **Outcome definition (large airway collapse)** (0: no specific criteria presented; 1: specific criteria) |
| **LAC studies with healthy volunteers** |
| Leong et al. 20171 | 1 | 0 | 2 | 9 | 1 | 1 |
| Dal Negro et al. 20132 | 0 | 0 | 0 | 2 | 0 | 1 |
| O’Donnell et al. 20123 | 1 | 1 | 2 | 2 | 1 | 0 |
| McDermott et al. 20094 | 1 | 0 | 0 | 2 | 1 | 1 |
| Heussel et al. 20045 | 1 | 0 | 0 | 2 | 0 | 1 |
| **LAC studies with COPD patients** |
| Leong et al. 20171 | 1 | 0 | 0 | 1 | 1 | 1 |
| Sindhwani et al. 20166 | 1 | 0 | 0 | 0 | 1 | 1 |
| El Sorougi et al. 20167 | 1 | 0 | 0 | 0 | 0 | 1 |
| Represas-Represas et al. 20158 | 1 | 0 | 0 | 0 | 1 | 1 |
| O’ Donnell et al. 20149 | 1 | 0 | 0 | 0 | 1 | 0 |
| Boiselle et al. 201210 | 1 | 0 | 1 | 0 | 1 | 1 |
| Heussel et al. 20045 | 1 | 0 | 0 | 1 | 0 | 1 |

**e-Table 3. Summary of 5 studies reporting the prevalence of large airway collapse in healthy subjects**

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| --- | --- | --- | --- | --- | --- |
| **Study** | **Study design** | **Study subjects** | **Diagnostic modality** | **Diagnostic threshold for large airway collapse** | **Prevalence of large airway collapse** |
| Dal Negro et al. 20132 | Prospective, single centre | n=62, non-smokers without any obstructive disease | Bronchoscopy | >75% | 1.6% |
| Leong et al. 20171 | Prospective, single centre | n=53, subjects with no respiratory symptoms, no prior diagnosis of chest disease, and not taking any respiratory medications  | CT | >50% | 0% |
| O’Donnell et al. 20123 | Prospective, single centre | n=81, lifetime non-smokers, no respiratory symptoms or known respiratory disease | CT | >50% | 56% |
| McDermott et al. 20094 | Prospective, single centre | n=10, subjects with no smoking history and no respiratory disease | CT | >50% | 0% |
| Heussel et al. 20045 | Prospective, single centre | n=15, Life-long non-smokers, FEV1 >70% predicted | MRI | >50% | 33.3% |

**e-Table 4. Summary of 8 studies reporting the prevalence of large airway collapse in patients with chronic obstructive airway diseases (COPD or asthma)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study** | **Study design** | **Study subjects** | **Diagnostic modality** | **Diagnostic threshold for large airway collapse** | **Prevalence of large airway collapse** |
| Leong et al. 2017a1 | Prospective, single centre | n=40, stable outpatients with COPD | CT | >50% | 35% |
| Leong et al. 2017b1 | Prospective, single centre | n=64, hospitalized in patients with acute exacerbation of COPD | CT | >50% | 39% |
| Bhatt et al. 201611 | Retrospective multi centre | n=8820, ex or active smokers with COPD (43.7%) and asthma (16.6%). | CT | >50% | 5% |
| Sindhwani et al. 20166 | Prospective, single centre | n=25, patients with COPD or asthma (stable on medical management but having persistent wheezing) | CT | >50% | 40% |
| El Sorougi et al. 20167 | Prospective, single centre | n=30, patients with COPD | CT | >50% | 20% |
| Represas-Represas et al. 20158 | Prospective, single centre | n=53, patients with COPD | CT | >50% | 9.4% |
| Dal Negro et al. 20132 | Prospective, single centre | n=202, patients with asthma | Bronchoscopy | >50% | 41.1% |
| Boiselle et al. 201210 | Prospective, single centre | n=100, patients with COPD | CT | >80% | 20% |
| Heussel et al. 20045 | Prospective, single centre | n=38, patients with COPD | MRI | >50% | 69.6% |

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