**Table 1**: Table of Evidence

|  |  |  |  |
| --- | --- | --- | --- |
| 1st Author/Year Country | Study Design  Study Size | Primary Purpose of Study | Summary of Major Findings  \* Statistically Significant |
| Kaneko (2003)  Canada | Case-control  n=60 | To evaluate OSA relationship in stroke patients to functional capacity and length of hospital stay | 60% of stroke patients had OSA  \*Stroke patients with OSA have increased length of hospital stay and decreased functional capacity and independence |
| Martinez (2004) Spain | Cross sectional  n=139 | To analyze prevalence of OSA in acute ischemic stroke related to time of onset | 60% of patients with sleep onset or within 1st hour of awakening stroke onset have severe OSA with AHI at 33.  \*OSA = independent stroke risk factor in sleep onset stroke |
| Artz (2005)  USA | Cross sectional  4 year longitudinal  n=1475; n=1189 | To determine OSA prevalence, incidence and increase risk for stroke in general adult population | \*Persons with OSA at AHI ≥ 20 have 4-fold increased odds for stroke adjusted for confounding factors. Increased risk of first-ever stroke over next 4 years. |
| Cadihac (2005)  Australia | Cross sectional  n=78 | To assess OSA prevalence in stroke survivors 3 years after stroke | OSA with AHI ≥5 still present 3 years after stroke at a comparable rate found in acute stroke studies indicating OSA is an independent stroke risk factor probability |
| Dziewas (2005)  Germany | Cross sectional  n=102 | To determine frequency of OSA in first and recurring ischemic stroke patients | 94% stroke patients had OSA at AHI ≥10  \*OSA at AHI ≥10 was identified as an independent risk factor for stroke recurrence |
| Martinez (2005) Spain | Observational; 18 months  n=95 | To evaluate if CPAP prevents new vascular events in stroke/TIA patients with OSA level of AHI≥20 | \*Stroke/TIA patients who did not use CPAP had 5-fold increase in vascular events  CPAP protects against vascular events and recurrent strokes |
| Yaggi (2005)  USA | Observational; 3.4 years  n=1022 | To determine if OSA increases risk for stroke or death independent of other cardiovascular risk factors | 68% of patients had OSA with mean AHI of 35  \*Increased OSA severity was associated with increased risk for stroke or death from any cause independent of other risk factors |
| Bassetti (2006)  Switzerland | Observational; 5 years  n=152 | To evaluate short-term and long-term CPAP compliance in stroke patients  To compare auto-CPAP to PSG results  To assess OSA effects on recurrent vascular events, stroke and mortality | 51% of patients started CPAP, only 15% continued long term  Good AHI correlation between PSG and auto-CPAP results  Sleep-onset stroke was independently associated with OSA  Long term stroke mortality was associated with initial AHI,  age, hypertension, diabetes and sleep-onset stroke |
| Munoz (2006)  Spain | Observational; 6 years  n=394 | To investigate OSA as independent stroke risk factor in the elderly | \*Elderly patients with severe OSA (AHI≥30) had increased stroke risk independent of other risk factors |
| NorAdina (2006)  Malaysia | Cross sectional  n=28 | To determine OSA frequency in recent ischemic stroke pts and the OSA relationship to other stroke risk factors | 93% of stroke patients had OSA at AHI≥5  Diabetes & smoking history common in acute stroke pts with OSA level at AHI≥15 |
| Wierzbicka (2006) Poland | Cross sectional  n=43 | To evaluate OSA frequency in acute ischemic stroke and TIA patients | 63% of stroke and TIA pts have OSA without significant relationship to other stroke risk factors  Stroke and TIA patients would benefit from OSA screening |
| Broadley (2007)  Australia | Observational; 6 weeks  n=55 | To determine OSA prevalence and association with other stroke risk factors in acute stroke patients | 53% of stroke patients had OSA with no other stroke risk factors or changes in 6 weeks suggesting OSA existed prior to stroke independent of other stroke risk factors |
| Rola (2007)  Poland | Observational  n=70 | To evaluate OSA incidence in TIA and stroke patients and correlate stroke severity and improvement to AHI level | 65% stroke patients and 67% of TIA patients had OSA  \*OSA severity (higher AHI) correlates with increased stroke severity and decreased neurological recovery |
| Sahlin (2008)  Sweden | Observational; 10 years  n=132 | To investigate whether OSA or central apnea related to reduced long-term survival among stroke patients | \*There was 75% increased risk of early death in stroke patients with OSA compared to non-OSA stroke patients  Central apnea was not associated with increase risk of death |
| Valham (2008)  Sweden | Observational; 10 years  n=392 | To evaluate the relationship between OSA and stroke, death or myocardial infarction in symptomatic coronary artery disease (CAD) patients | 54% of CAD patients had AHI≥5  Stroke occurred in 12% of these patients by 10 year follow up  \*OSA at AHI≥15 presents 3.56 times increased stroke risk in CAD patients independent of other risk factors |
| Martinez (2009)  Spain | Observational; 5 years  n=166 | To analyze the independent impact of long-term CPAP use on the mortality in ischemic stroke pts | \*63% of stroke patients were CPAP intolerant increasing their mortality rate by 2.69 times compared to CPAP users. CPAP decreased mortality to the risk level of that of mild or no OSA |
| Bravata (2010)  USA | RCT  Feasibility study  n=70 | To evaluate OSA in TIA patients, their auto-CPAP adherence and recurrent vascular event occurrence  To determine feasibility of auto-CPAP | 57% of TIA patients had OSA at baseline, 59% at 90 days  40% of CPAP users had acceptable adherence  Recurrent vascular events were 16% higher in non-CPAP users  Feasible to provide auto-CPAP to acute TIA patients in hospital |
| Chan (2010)  Canada | Case-control,  n=66 | To determine OSA prevalence and severity in minor stroke or TIA patients  To describe clinical profile and 3 month  comparison of OSA severity level | 62% of stroke/TIA patients had OSA with 44% having moderate to severe OSA level with less obesity and excessive sleepiness  No severity change was observed at 3 months indicating OSA present before stroke representing an independent stroke risk |
| Redline (2010)  USA | Observational; 8.7 years n=5422 | To quantify the incidence of ischemic  stroke associated with OSA in diverse community-based sample | \*193 strokes were observed revealing that OSA at AHI > 19 increases risk for first time stroke in men by 2.86 times & each one-unit AHI increase predicts increase stroke risk by 6% |
| Bravata (2011)  USA | RCT  Feasibility study  n=55 | To describe OSA prevalence in acute  ischemic stroke patients  To evaluate auto-CPAP feasibility  To examine CPAP effects on NIHSS | 87% of acute stroke patients have OSA, 67% have it at 1 month  Auto-CPAP was feasible to initiate in acute stroke patients  \*Patients with highest CPAP use had 3 NIHSS improvement indicating decrease stroke severity and increase recovery |
| Joo (2011)  South Korea | Case-control  n=74 | To determine OSA prevalence in acute  ischemic stroke/TIA patients | OSA was found in 69% of TIA patients and 51% in stroke patients  23% of patients had sleep-related strokes with a higher AHI |
| Parra (2011)  Spain | RCT  n=126: | To assess benefits of 2 years of CPAP in ischemic stroke patients on function, mortality and new vascular events | \*Stroke patients with effective CPAP use accelerated neurological recovery, decrease mortality rate and delayed vascular events |
| Ryan (2011)  Canada | RCT  n=44: | To determine CPAP benefits for stroke patients in stroke rehab units | \*CPAP improved function, motor impairment & depression but not neurocognitive function in stroke patients in stroke rehab unit |
| ELKholy (2012)  Egypt | Case-control  n=50 | To assess OSA frequency and features in stroke/TIA patients and evaluate the  Berlin Questionnaire effectiveness | 67% of stroke/TIA patients had OSA with a high Berlin score  Berlin Questionnaire is moderately sensitive and highly specific as an OSA screening tool |
| Hsieh (2012)  Taiwan | Case-control  n=71 | To determine the relationship between OSA and wake-up stroke in ischemic stroke patients | Wake-up stroke pts have higher AHI & lower Sa02  \* OSA with AHI>30 was the only independent stroke risk factor  identified for wake-up stroke in ischemic stroke patients |
| Martinez (2012)  Spain | Observational; 7 years  n=166 | To analyze 7-year impact of OSA and CPAP effects on non-fatal vascular events reoccurrence in ischemic stroke patients | \*Stroke patients with OSA at AHI ≥20 and CPAP intolerant have a 2.87-fold increase risk for new stroke and CPAP use reduces risk suggesting that OSA is an independent stroke risk factor |
| Ahn (2013)  Korea | Observational; 3 months  n=293 | To evaluate OSA prevalence and effects on recovery in acute ischemic stroke patients | 63% of stroke patients had OSA with 35% having AHI ≥20  \*OSA patients had increase NIHSS, dysphagia and disability  \* 48% of stroke patients with OSA had sleep-onset |
| Kepplinger (2013) Germany | Observational; 6/12 months  n=61 | To evaluate the feasibility of early OSA screening in acute ischemic stroke patients and its impact on post-discharge OSA care  To investigate clinical presentation of OSA  in acute ischemic stroke patients | 86% of stroke/TIA patients had OSA at AHI≥5, median of 20  Excellent feasibility for early OSA screening on acute ischemic stroke patients in stroke unit and improving OSA post-discharge care with 71% having a PSG and 25% started on CPAP by 1 year  OSA severity did not correlate with excessive sleepiness |

Abbreviations: AHI = apnea-hypopnea index or Respiratory Disturbance Index equivalent), CPAP = continuous positive airway pressure, OSA = obstructive sleep apnea or sleep disordered breathing according to OSA criteria, PSG = polysomnogram, RCT = Randomized Control Trial, TIA = transient ischemic attack