Cost Effectiveness of CPAP Therapy for the Patients with Obstructive Sleep Apnea

Obstructive Sleep apneas is a common disorder characterized by recurrent collapse of the upper airway during sleep and is associated with an increased risk of motor vehicle crashes and other problems. Most common treatment for OSA is CPAP therapy with dental appliances being a useful adjunct. CPAP therapy is expensive and needs to be used possibly for a life time. But is it cost effective as a whole for the general population?

Direct Cost of the Sleep Studies:

Direct cost effectiveness of the cpap therapy vs HST followed by Autopap therapy. Medicare Payment: 2014 shows the following: PSG study (95810) was $618.08, while the cost of CPAP Titration study (95811) was $648.38. And the total cost of the sleep study for one patient was $1266.46. In contrast, HST (2012) cost from Medicare was $183.80. With a saving of 1082.66 per patient studied. In addition there are direct health care costs from the associated conditons. eg, cardiovascular disease, diabetes, depression, work-related injuries and motor vehicle crashes. While the direct costs of all this is not available in USA there are studies which are available from studies done in Australia.

Indirect Costs:

We have to calculate the indirect savings for the specific treatment. As we know from the earlier model that OSA causes increased motor vehicle crashes. Using the Markov model the costs and quality of life gained can be calculated accounting for the gains from the reduced motor vehicle crashes (MVC). When quality of life, costs of therapy and MVC outcome are considered CPAP therapy for patients with OSA is economically attractive. The treatment of CPAP reduced MVC by a factor of approximately 7 (odds ratio of MVC with CPAP compared to no CPAP.0.15 (C.I 0.10-0.22) from the meta analysis study[1]

The other indirect costs related to sleep apnea include: Work related injuries, including production disturbance, legal investigation, human capital and travel. Also we should include costs related to motor vehicle crashes: long term care, work force/labor disruption, quality of life. legal costs, repairs, travel delays, administration and property damage.[2]

Untreated OSA:

Untreated OSA leads to multiple medical problems such as hypertension, cardiovascular disease, injuries, and mood disorders that potentially increase medical care utilization. Kapur[3] evaluated 238 adult patients with OSA who were members of HMO matched to 476 control subjects. They compared the direct cost of patients with and without sleep apnea during and prior to the diagnosis. Mean medical costs of patients with OSA were significantly greater ($ 2720) than those of matched controls ($1384).

Also remember the treatment of OSA with CPAP also produces significant cardiovascular and metabolic benefits. In one study it showed that treatment may reduce cardiovascular and pulmonary disease costs by $ 2800 per year.[4]

In addition the cost effectiveness of cpap has been compared to dental devices and life style advice for adults. On average, CPAP was associated with higher cost and Quality –adjusted life-year (QALY) compared to dental devices or life style . In a case analysis the incremental cost effectiveness of ratio (ICER) for CPAP compared to dental devices was around 4,000 pounds per QALY (2005-06 prices). The probability that CPAP is more cost effective than dental devices or life style advice at a threshold value of 20,000 pounds per QALY was 0.78 for men and 0.80 for women. Sensitivity analysis shows that ICER for CPAP consistently fell below 20,00 pounds per QALY gained. NICE guidelines[5]

Health Care Utilization:

Cost effectiveness is usually assessed by the incremental cost effectiveness ratio (ICER).,which is the ratio of incremental cost and incremental change in quality adjusted life years (QALY) that follows from the adoption of a treatment (CPAP Vs No CPAP). In general ICER of $ 50,000.00 per QALY is considered to be cost effective.

But what is the impact of cpap treatment on the financial health of the nation?. This also has been addressed in a NHS study. The Markov model was constructed to assess the cost effectiveness of the CPAP compared with no treatment. The model depicted a 55 years old patient with severe OSAHS as defined by AHI > 30/hour and Epsworth Sleepiness scale of >12 for a period of 14 years. NICE considers that a technology that has a cost effectiveness of < 20,000.00 pounds per QALY potentially affords an effective use NHS resources. The use of CPAP over 14 is therefore expected to afford the NHS a cost effective technology since, after 2 years of treatment with CPAP, the cost per QALY gained is < 10,000 and after 13 years CPAP becomes dominant.[6] Treatment of OSAS reversed the trend of increasing health care utilization seen prior to diagnosis. Preexisting ischemic heart disease results in a negative impact on health care utilization. CPAP results in long term health benefit, as measured by the use of health care services.

CPAP is also cost effective in the U.S. context where they used t he Markov model and found that ICER of CPAP was found to be $3,345 per QALY.[7]

CPAP compares very favorably with many medical treatments; Use of cholesterol lowering medications in the primary prevention of cardiovascular events -$ 54,000-,400,000 /QALY gained : Biologic agents in the treatment of rheumatoid arthritis-$ 30,500/QALY.[8]

Recent Developments:

In the last few years due to the exponential growth of sleep related medical expenses the insurance companies have made it more difficult for physicians to get preauthorization to conduct sleep studies and cpap therapy. However, most of the health Insurers do cover home sleep testing and do not need preauthorization which is good for initial screening. While it is their goal to make profit for their shareholders, the goal of physicians should be to be the patient advocate. In the long run the medical expense for the sleep related testing and treatment is cost effective and should not be denied or postponed in the name of "Unnecessary test" or "preauthorization – required" by the health insurers.[9] Regulatory authorities should take note of cost effectiveness of CPAP therapy and ensure that the health insurers do comply sleep services as covered services. Also when the patients continue to have symptoms like excessive drowsiness, or fatigue, it is right to do a CPAP (re)titration of the patient in the laboratory even though many insurance companies routinely reject the authorization process to control costs and increase revenue for the shareholders and executive's. This has to be watched by the Professional society's like AASM or the ACCP.

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