42 Markov and 19 MC. Median time since publication was 6 years. Most models concerned Type 2 DM (57%) and prevention or disease-management programs (54%). In average, models had 11 states and 2.8 complications. MC were significantly more used than Markov when both type 1 and 2 DM and a prevention or disease management program were concerned. Models had, significantly, a higher number of states and complications. The choice of the model type was shown to be influenced by the number of DM and of complications considered. The justification to perform a Monte–Carlo was more often documented than those to perform a Markov (74% vs. 38%). The model was considered accurate with the study question in respectively 86% of Monte–Carlo and 64% of Markov. CONCLUSIONS: This study allowed to statistically identify factors influencing the type of model used to simulate DM. It is an interesting tool for modelers in their decision process to build a model. Information such as data and time availability or financial context could not be collected.

SIMPLIFICATION OF PATIENT LEVEL SIMULATIONS TO COHORT MODEL FOR SCENARIO ANALYSIS

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OBJECTIVES: In the last 13 years, models built to appraise health technologies have grown in complexity to accurately reflect the natural history of disease and calculate costs and benefits accordingly. The advantage of using patient level simulation models (PSM) over cohort models (CM) is that CM may become unwieldy with thousands of branches. This usually happens if the patient characteristics influence the risks of complications and these vary over time, or if there are many comorbidities to take into account and the risk of each complication is time dependent. In this case, a typical Markov cohort model may be unsuitable. However a PSM can take a long time to run in order to produce results. Aim of this research is to present a case study where a PSM is simplified with a Markov structure and to compare the results of the two models. METHODS: We describe how a PSM for diabetes may be adapted to a CM, stating all the limitations. RESULTS: Provided that the PSM gives similar answers to the CM, the CM may be used as a surrogate for conducting complex sensitivity analysis (e.g., 3-way analysis or tornado diagrams). The advantage is that this model would produce results “instantaneously.” CONCLUSIONS: The adaptation of a PSM model to a cohort model may be a desirable feature if the model is required by a non technical audience. This is the case for “due diligence” models that are increasingly required by investors to assess the value of assets that a pharmaceutical company considers to buy or sell. Further research is needed to have a powerful test to assess whether the difference in results between a simplified CM model and the PSM are statistically significant.

MUSCULAR-SKELETAL DISORDERS – Clinical Outcomes Studies

HIGHER COMORBIDITIES IN PATIENTS WITH GOUT VS. WITHOUT GOUT IN THE US GENERAL POPULATION: THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) 2007-2008

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OBJECTIVES: While the comorbidity burden of gout in the US has been considered substantial and may have been rising over the past decade, no contemporary national data are available. We estimated the prevalence of major comorbidities in patients with gout compared with those without gout based on a recent, nationally representative sample of US men and women (National Health and Nutrition Examination Survey [NHANES] 2007–2008). METHODS: Using data from 5707 participants in NHANES 2007–2008 (2797 men and 2910 women) aged 20 years and older, we determined the prevalence of major comorbidities among individuals with gout, including hypertension, renal impairment, nephrolithiasis, diabetes, myocardial infarction, heart failure, stroke, and obesity. We also compared the prevalence with those without gout using age- and sex-adjusted logistic regressions. Case definitions of comorbidities were based on an affirmative answer to a question asking if a physician or a health professional had diagnosed the corresponding condition. RESULTS: Among US adults with gout, 74% had hypertension, 53% obesity, 26% diabetes, 24% nephrolithiasis, 14% myocardial infarction, 11% heart failure, 10% stroke, and 9% renal impairment (Table). Prevalence of these comorbidities among individuals with gout was substantially higher than among individuals without gout. Age- and sex-adjusted odds ratios (95% confidence interval [CI]) were 4.19 (2.75–6.39) for hypertension, 2.35 (1.54–3.65) for myocardial infarction, 2.68 (1.88–3.83) for tension, 2.35 (1–55–3.57) for obesity, 2.36 (1.49–3.73) for diabetes, 2.10 (1.39–3.18) for depression, and 1.93 (1.24–3.01) for obesity. CONCLUSIONS: These findings from the latest nationally representative sample of US adults in NHANES 2007–2008 confirm that the prevalence of comorbidities among individuals with gout is substantial and considerably higher than among individuals without gout.

IMPROVEMENT IN EFFICACY AND SAFETY OUTCOMES AFTER CERVICAL ARTHROPLASTY VERSUS STANDARD ANTERIOR CERVICAL DISECTOMY AND FUSION (ACDF) SURGERIES: A META-ANALYSIS OF PUBLISHED RCTS

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BACKGROUND: Cervical arthroplasty has been used successfully worldwide for over a decade in patients with cervical degenerative disc disease (CDDD). Several RCTs have documented the clinical advantage of arthroplasty vs. fusion for this patient population. Synthesis of outcomes from published RCTs is needed to consolidate the evidence-base for arthroplasty in CDDD. OBJECTIVES: To examine current evidence of safety and efficacy in the use of arthroplasty to treat CDDD and conduct a pooled analysis of high level comparative outcomes for arthroplasty versus fusion. METHODS: A systematic search of the PubMed, EMBASE, MEDLINE, CRD, York, and Cochrane Library data-bases, plus hand searching of grey literature were undertaken in January 2010. RESULTS: A total of 554 non-duplicate citations were retrieved. Only three studies of arthroplasty versus fusion with 2 years follow-up met all inclusion criteria and were of reasonable quality according to GRADE criteria) to pool; a meta-analysis was conducted using RevMan’s software (Cochrane 2008). Persons undergoing single-level arthroplasty had significantly improved neurological success (RR 1.14, 95% CI [1.07, 1.21] P < 0.001). Neck Disability Index (NDI) success (RR 1.13, 95% CI [1.05, 1.22] P = 0.001) and overall success (RR 1.22 95% CI [1.12, 1.33], P = 0.00001) at 2 years post surgery compared to fusion. Secondary surgeries (any revision, removal, or re-operation of the implant or supplemental fixation) after 2 years were also significantly lower with arthroplasty (13.621) compared to fusion (39.592), 0.32 95% CI [0.17, 0.59] P = 0.0003. Total number of patients undergoing reoperations at adjacent levels was lower in arthroplasty-treated patients (9621) vs. ACDF (17592), however it was not statistically significant (P = 0.09). Given the small numbers of patients undergoing reoperations at adjacent levels, longer term results are needed to increase precision of this estimate. CONCLUSIONS: A formal pooled analysis of 2-year RCT data demonstrates clinically significant improvements in efficacy and safety outcomes in CDDD patients who have undergone arthroplasty versus standard fusion.