PR2

DEVELOPMENT AND PSYCHOMETRIC PROPERTIES OF A PEDIATRIC PERCEIVED COGNITIVE FUNCTION ITEM BANK (PEDSPCF)

Lai JS[1], Zelko F[2], Butt Z[1], Cella D[1], Magasi S[1], Goldman S[2]
[1]Northwestern University, Chicago, IL, USA, [2]Children's Memorial Hospital, Chicago, Chicago, IL, USA

OBJECTIVES: Cognitive difficulties are common among children with neurological diseases. A brief-yet-precise screening tool is needed to facilitate timely referral for neuropsychological testing in this population. Based on our prior research with clinicians, a standardized, self-report measure would be efficient and useful for this purpose. This paper reports the development and psychometric properties of a pediatric perceived cognitive function item bank (pedsPCF). **METHODS:** The pedsPCF consists of 45 items, developed via children/parent/clinician/teacher interview and literature review, and were qualitatively evaluated by children/parents and clinicians. The calibration sample includes data from 1,497 children: 49% aged 7–12; 45% 13–17; 6% 18–21. Of them, 56% were males, 16% repeated grades in school, 39% received some forms of special education, 30% were given medication for attention difficulties, and 27% had at least one of the following diagnoses: epilepsy, traumatic brain injury, cerebral palsy or brain tumor. Data were randomly divided into two datasets to be used for exploratory factor analysis (EFA, n = 747) and confirmatory factor analysis, specifically, bi-factor analysis (n = 750). The clinical usefulness of the pedsPCF was evaluated by determining whether scores could discriminate between different sub-groups. **RESULTS:** One item was deleted due to its low Spearman rho and item-scale correlation. Results from the EFA suggested a single factor among the remaining 44 items based on a scree plot. Furthermore, all items had significant loadings (>0.3) on the first factor after PROMAX rotation. Bi-factor analysis supported sufficient unidimensionality with satisfactory fit indices (CFI = 0.923; TLI = 0.992; RMSEA = 0.112) and all items had significantly higher loadings onto the general factor versus local factors. T-tests showed that the pedsPCF significantly differentiated samples defined by medication use, repeated grades, special education status, and neurological diagnosis, all $p < 0.0001$. **CONCLUSIONS:** The initial psychometric properties of pedsPCF are promising. Recruitment for the clinical validation study is in progress.

PR3

FIBROMYALGIA FATIGUE—DEVELOPMENT OF A CONCEPTUAL MODEL BASED ON QUALITATIVE PATIENT INTERVIEWS

Mease P[1], Humphrey L[2], Arbuckle R[2], Williams DA[3], Danneskiold-Samsoe B[4], Gilbert C[5]
[1]Seattle Rheumatology Associates, Seattle, WA, USA, [2]Mapi Values Ltd, Bollington, UK, [3]University of Michigan, Ann Arbor, MI, USA, [4]Frederiksberg Hospital, Frederiksberg, Denmark, [5]Pfizer Ltd, Sandwich, UK

OBJECTIVES: Although fatigue is increasingly recognized as an important symptom in fibromyalgia (FM), qualitative evidence regarding how patients describe this and the impact it has on their daily lives is limited. We conducted qualitative research to better understand what individuals with FM mean by 'fatigue', assessed the impact it had on their lives, and developed a conceptual model to represent these findings. **METHODS:** Open-ended, qualitative interviews were conducted with 40 FM patients (US (n = 20), Germany (n = 10) and France (n = 10)) using open-ended questions and creative tasks to elicit unbiased information about FM and FM fatigue. Transcripts were analysed using qualitative methods based on grounded theory. **RESULTS:** Participants were 70% female; mean age 48.7 years (range 25–79) with a range of education levels. Thirty-one (77.5%) spontaneously described experiencing fatigue/tiredness/lack of energy due to FM. The conceptual model developed depicts key elements of FM fatigue from a patient perspective, which was discussed as being more severe than normal tiredness, constant/persistent and unpredictable. In the model it is defined as: an overwhelming feeling of tiredness (n = 17, 42.5%), not relieved by resting/sleeping (n = 14, 35%), not proportional to effort exerted (n = 25, 62.5%), associated with a heavy feeling in their body (n = 16, 40%) or a weak feeling in their muscles (n = 9, 22.5%), makes it difficult to motivate themselves to do things (n = 23, 57.5%), affects things they want to do (n = 27, 67.5%), or makes tasks take longer to do (n = 15, 37.5%), and makes it difficult to concentrate (n = 21, 52.5%), think clearly (n = 12, 30%) or remember things (n = 9, 22.5%). **CONCLUSIONS:** The majority of individuals with FM experience fatigue and describe how it is more severe than normal tiredness. The qualitative data supported development of a conceptual model of key elements of FM fatigue from the patient perspective which will be used to construct an FM specific fatigue measure.

PR4

LINEAR SCORING RULES FOR PATIENT REPORTED OUTCOMES AND PATIENT PREFERENCES

Mohamed AF[1], Hauber AB[1], Johnson FR[2]
[1]RTI Health Solutions, Research Triangle Park, NC, USA, [2]RTI International, Research Triangle Park, NC, USA

BACKGROUND: Many Health-Related Quality-of-Life (HRQOL) and Patient-Reported Outcomes (PRO) instruments are scored by averaging or summing Likert-category values over all items or domains of the elicitation instrument, yielding domain-specific scores or a total score for the entire instrument. **OBJECTIVES:** To review the evidence on whether linear scoring algorithms in HRQOL/PRO instruments are consistent with patient preferences in asthma, oncology, and obesity. **METHODS:** Three studies used similar methods to adapt the Onset-of-Effect Questionnaire (OEQ), the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-C30 (EORTC QLQ-C30), and the Impact of Weight on Quality of Life Questionnaire-Lite Version (IWQOL-Lite) to choice-format conjoint surveys. In each study, the researchers used the domains and categories of a HRQOL/PRO instrument to determine the attributes and levels for the conjoint surveys. They applied similar choice-modeling approaches to estimate the relative importance of health outcomes assessed by each of the three HRQOL/PRO instruments. **RESULTS:** For each HRQOL/PRO instrument, the domains were not equally important to patients and improvements in adjacent categories were not equally important within and across domains. In particular, the asthma and oncology study results indicated that patient preferences for the health outcomes were strongly non-linear. Overall, there were statistically significant and clinically meaningful divergences between the relative importance to patients of individual domains and categories and the linear, additive assumptions required by scoring algorithms. **CONCLUSIONS:** Conjoint methods provide a practical means for eliciting preference-based scoring weights for HRQOL/PRO domains. The results provide an alternative to the conventional linear scoring approach that reflect underlying preference non-linearities and variability in importance of domains.

PODIUM SESSION III: VACCINES – MODELING STUDIES

VA5

INDIVIDUALLY-BASED DYNAMIC MODELING OF INFECTIOUS DISEASES: COST-EFFECTIVENESS OF ADOLESCENT PERTUSSIS BOOSTER VACCINATION FOR THE NETHERLANDS

de Vries R, Postma MJ
University of Groningen, Groningen, The Netherlands

OBJECTIVES: Despite widespread immunization programs, a clear increase in pertussis incidence is apparent in many developed countries during the last decades. Consequently, additional immunization strategies are considered to reduce the burden of disease. This study aims at designing an individually-based dynamic model to estimate the cost-effectiveness of adolescent pertussis booster vaccination in The Netherlands. **METHODS:** We designed a discrete event simulation (DES) model to predict the epidemiological and economic consequences of implementing universal adolescent vaccination. We used national age-specific notification data over the period 1996–2000 -corrected for underreporting- to calibrate the model assuming a steady state situation. Thereafter adolescent vaccination was introduced. Other input parameters of the DES-model were obtained from literature and, if not available, from expert opinions (e.g. on waning immunity). Subsequently, medical unit costs from national guidelines were attached to pertussis-related resource use and linked to the epidemiological outcomes. As there is no consensus on the duration of immunity acquired by natural infection, we considered two scenarios that differed in duration of protection (i.e. 8y and 15y). **RESULTS:** Although the steady state situation resulted in different ratios of symptomatic versus asymptomatic cases (0.10:0.90 and 0.17:0.83 in the whole population for the 15- and 8-year scenario respectively), the total incidence decreased in the whole population as a result of adolescent vaccination in both scenarios. From a societal perspective the cost-effectiveness was estimated at €4418/QALY (range: 3205–6364 € per QALY) and €6371/QALY (range: €4139–9549 per QALY) for the 8-year and 15-year protection scenarios respectively. Sensitivity analyses revealed that the outcomes are most sensitive to the quality of life weights used for pertussis disease. **CONCLUSIONS:** To our knowledge we designed the first individually-based dynamic framework to model pertussis transmission in the population. This study indicates that adolescent pertussis vaccination is likely to be a cost-effective intervention for The Netherlands.

VA6

INTEGRATED DYNAMIC TRANSMISSION/COST-EFFECTIVENESS MODEL FOR INFLUENZA A AND B PART I: DEVELOPMENT OF AN INTEGRATED MODEL

Pitman RJ[1], Leeuwenkamp O[2]
[1]Oxford Outcomes Ltd, Oxford, Oxfordshire, UK, [2]MedImmune, Cambridge, Cambridgeshire, UK

OBJECTIVES: To build an influenza cost-effectiveness model, combining a population based compartmental influenza transmission model with a standard cost-effectiveness analysis. **METHODS:** Transmission dynamics are simulated using a system of linked differential equations. The population is compartmentalised into those who are *susceptible* to infection, those *exposed* (infected) but not infectious, those who are *infectious* and those who are *recovered* and immune due to infection or vaccination. **RESULTS:** Antigenic drift is simulated using a published approach and assuming that immune individuals lose immunity and become susceptible at a constant rate (different for influenza A and B). Latent and infectious periods of two days are assumed. Age-specific mortality rates and annual birth rates are incorporated, consistent with a realistic age structure. Age-dependent population mixing patterns are captured in a 'Who Acquired Infection from Whom' matrix. The transmission coefficient is adjusted to obtain a good simulation fit with actual data. A sine function simulates seasonal variation, giving a peak that is 1.43 times its mean value, resulting in a 2-year inter-epidemic period, for each A subtype (H1N1/H3N2). These are out of phase, so an A type epidemic occurs annually. Duration of protection in the model is 6 years and 12 years for influenza A and B, respectively, supporting a good fit with actual transmission data and a 2-year inter-epidemic period. Cost-effectiveness component is linked to the simulated portion of the population that is symptomatic using age stratified resource use information attributable to influenza illness. **CONCLUSIONS:** The