PDB27

COST OF INPATIENT MANAGEMENT OF HYPOGLYCAEMIA IN FRANCE

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OBJECTIVES: Severe hypoglycaemias occurring in diabetes care are associated with a major economic burden on health care systems, with a major part of the direct costs resulting from the small proportion of patients who are admitted to hospital. We assessed the inpatients costs of severe hypoglycaemic events in Type 1 and 2 diabetes (SHE) patients in France. **METHODS:** The study was done using the 2012 French National Database on hospital care (PMSI). This comprehensive database covers all hospital stays in the French population (over 20 million hospital stays per year). SHE were identified using ICD10 codes of hypoglycaemias (E160, E161, E162, T383) in combination with diabetes codes (E11, E10, E13, E14, N083) and excluding gestational diabetes. Directs costs to the health care system were estimated using the French National Costs study (2011 values). **RESULTS:** Overall, in 2012, 17,835 stays for diabetes related hypoglycaemias were identified in the database corresponding to 16,406 patients. 8.7% of patients were hospitalized twice in the year for SHE, 51% were male and aged 66.7 years on average (SD 19.7). 90% of stays occurred in public hospitals and mean length of stay was 8.1 days (median 7.0). The mean direct cost of one SHE hospital stay was €4,360. Extrapolated to the whole country the direct cost of hospitalized SHE was €77.7 million which roughly correspond to 1.2% of the overall diabetes costs for the health care system. Such value would be considered a conservative estimate due to potential underreporting of cases in the database. **CONCLUSIONS:** Our study confirmed that hypoglycaemic events lead to substantial costs for the community even it was limited to direct costs in inpatient setting. As the short-term and long term consequences of hypoglycaemia begin to be better understood, more studies have to be done to estimate the full economic burden of this disease.

PDB28

HEALTH CARE COST OF CONTROLLED VERSUS UNCONTROLLED TYPE 2 DIABETES PATIENTS IN GREECE

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OBJECTIVES: Health expenditure to treat and prevent T2DM and its complications was estimated at USD 345 million for OECD countries in 2010. These costs pose great burden to national health system's budget, which is already under pressure. In Greece there are no studies that provide information on the costs of T2DM patients including the cost of complications, hospitalizations and co-morbidities. The current study aimed to estimate the total cost of T2DM patients from a third party payer perspective. **METHODS:** A retrospective research study was performed in four major hospital diabetes centers and 211 patients with at least 10 years of T2DM from diagnosis. Patients were categorized in two groups, controlled and uncontrolled. Hospitalization and management of complications was based on DRG cost. Pharmaceutical and diagnosis cost was based on official NHS prices. Health care cost corresponds to 2012 Euros and the perspective used was of the Social Security Fund. Subgroup analysis was performed in order to evaluate the cost difference between controlled vs. uncontrolled, obese non-obese and various other subgroups. **RESULTS:** The mean age of patients was 72.9±8.1 years with mean T2DM duration 21.2±7.5 years, and mean HbA1c 7.3±1.0%. The mean average yearly cost of T2DM was €7.111 whereas only the18.8% was attributed to cost of antidiabetic drugs. Controlled patients (HbA1c $\leq$ 7) cost on average 6.366 and uncontrolled (HbA1c>7) €7.783. The mean hospitalization and complication cost was €2.456. It was found no difference of mean hospitalization and complication cost between controlled and uncontrolled patients (p=0.09). Co-morbidities cost absorbs the majority of the budget and was the differentiating factor between two groups. Few patients (21.8%) reported admission to hospital with similar hospitalization rates on number and duration between the two groups. **CONCLUSIONS:** T2DM is an expensive to treat disease with very high cost complications with economic and societal burden.

PDB29

HEALTH CARE COST OF TYPE 2 DIABETES PATIENTS IN GREECE: SUB-POPULATION ANALYSIS

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PDB30

ADRENAL INSUFFICIENCY: BURDEN OF DISEASE AND COST OF ILLNESS

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OBJECTIVES: To calculate the cost of illness (COI) associated with adrenal insufficiency (AI) in the UK. AI patients do not produce cortisol and require glucocorticoid replacement therapy (RT) to survive, which is predominantly immediate-release hydrocortisone in the UK. With current therapy, AI patients have increased morbidity and premature mortality, and suffer reduced quality-of-life. **METHODS:** The COI determines the direct and indirect costs over a 1-year period. The COI includes the cost of RT, primary and secondary care costs (GP and outpatient appointments; admissions for adrenal crises; diagnosis and management of AI) and those associated with reduced productivity (absenteeism). Direct costs were estimated using national reference costs, Payment by Results tariffs and other published data. AI prevalence and adrenal crises data were taken from published literature and activity data (hospital admissions for management of AI) from Hospital Episode Statistics (HES) data. A 2012 worldwide survey of AI patients was used to determine days taken off work and clinical expert opinion was sought to determine total outpatient appointments per year. The costs associated with premature mortality, the treatment and management of co-morbidities and the burden associated with reduced quality of life were not included due to lack of data. **RESULTS:** There are ~20,000 AI patients in the UK. Based upon the burden of disease calculations, the estimated COI associated with AI is £1,922 per patient or £39.7 million over 1 year: RT, £21.7 million; GP appointments, £1.8 million; secondary care, £4.4 million; and reduced productivity, £11.8 million. **CONCLUSIONS:** The high health care and social costs associated with AI highlight the clinical and economic need to improve RT. Indeed, as some consequences of the disease were not included in the calculations, £39.7 million is likely a considerable underestimate of the true burden of disease.

PDB31

DIRECT COST OF DIABETES MELLITUS AND ITS COMPLICATIONS IN SPAIN. SECCAID STUDY: SPAIN ESTIMATED COST CIBERDEM-CABIMER IN DIABETES

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OBJECTIVES: To assess the direct costs associated to type I and II diabetes mellitus (DM) from a health care perspective in Spain. **METHODS:** We performed a cost of illness study considering the prevalence approach. The use of resources was estimated from the existing Spanish health care databases and bibliographic references. Costs evaluated were: hospital costs (including outpatient care), primary care costs, drugs costs, consumables costs and additional tests costs. All costs were updated to 2012 euros. **RESULTS:** The total direct annual cost of DM was 5,809 million euros representing 8.2% of the total Spanish health expenditure. The total drug cost accounted for 2,232 million euros (38%) and was mainly due to the elevated contribution of non-antidiabetic drugs (24%). Hospital costs represented 1,934 million € (33%) and were mainly driven by the acute and chronic complications (17%). Cardiovascular disease cost (521 million €) and peripheral vascular disease costs (127 million €) were the most important complications cost drivers. The contribution of monitoring strips to the total cost was only 118 million € (2%). Total complications cost represented 2,143 million € (37% of the total direct cost). **CONCLUSIONS:** DM total direct costs are strongly conditioned by DM complications cost and have a considerable economic impact on Spanish health expenditure. In order to reduce the health and economic impact generated by DM, the introduction of measures and strategies focused on improving the efficiency of the treatment of the disease are crucial.

PDB32

QUANTIFYING THE DIRECT AND INDIRECT COSTS ASSOCIATED WITH SEVERE AND NON-SEVERE HYPOGLYCAEMIA IN SUBJECTS WITH TYPE-2 DIABETES WHO ARE TREATED WITH INSULIN

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OBJECTIVES: There have been a number of studies quantifying the direct and indirect resource implications associated with severe hypoglycaemia episodes (SHE) and non-severe hypoglycaemia episodes (NSHE). The objective of this study was to calculate the total direct and indirect economic burden associated with SHE and NSHE in insulin treated type 2 diabetes mellitus (T2DM) subjects. **METHODS:** We conducted two literature reviews of the MEDLINE database for studies published between June 1, 2007 and June 1, 2012. The first assessed the direct (primary and secondary care and treatment related) and indirect resource implications (lost productivity) associated with SHE and NSHE; the second established the frequency of NSHE and SHE in insulin-based clinical trials where sulfonylurea usage was also reported in T2DM. An economic model written in Microsoft Excel was developed to predict the expected annual per-patient cost (using 2011 US costs) associated with the incidence of hypoglycaemia. **RESULTS:** Resource utilisation from 6 studies and data characterising hypoglycaemia frequency were extracted from 82 studies for a total of 155 trial arms where the search criteria were met. Mean annual hypoglycaemia event rates were 16.4, 8.9, 4.8 and 2.6 for NSHE and 0.083, 0.039, 0.015 and 0.003 for SHE associated with baseline HbA1c levels of 6%, 7%, 8% and 9% respectively. Total expected annual per-patient hypoglycaemia costs were $929, $471, $237 and

$117 associated with HbA1c levls of 6%, 7%, 8% and 9% respectively. **CONCLUSIONS:** In insulin treated T2DM subjects lower HbA1c is associated with higher frequency of hypoglycaemia and associated costs. Failing to account for the cost burden associated with hypoglycaemia may underestimate the value of diabetes management strategies that minimize hypoglycaemia risk.

PDB33

COMPARATIVE ANALYSIS OF THE COST AND METABOLIC CONTROL IN DIABETIC CHILDREN USING INSULIN PUMPS

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OBJECTIVES: To assess the cost and metabolic outcomes in children with diabetes mellitus treated with CSII or with human insulin. **METHODS:** It is a cost-consequence analysis. Retrospectively were observed patients dossier and health care resources used during the period 1999 – 2012. The study sample included 34 children aged 3 to 18 years with type 1 diabetes. Seventeen of the children are using continuous subcutaneous insulin infusion (CSII) therapy and 17 using intensified dosage regime of human insulin. The duration of the disease, diabetic control, HbA1c deviation scores, height and weight were observed. Cost of pharmacotherapy, test strips were calculated and compared with the therapeutic outcomes in both studied groups. The average improvement of HbA (1c) after the CSII introduction was chosen as therapeutic outcome. **RESULTS:** Subcutaneous insulin infusion (CSII) systems are not a standard treatment for the Bulgarian children; they are of a limited usage and are not reimbursed. From the 34 children with diabetes type 1 observed 17 were on CSII (mean age 10 years, mean duration of diabetes - 7 years, average usage of CSII - 3 years). The test stripes costs 533 Euro/ year and their average cost according to the duration of the disease is 3779.45 Euro since diagnosis. The blood glucose monitoring system costs 20 Euro and for the duration of the disease - 4.96 Euro per patient per year. The CSII price is 3896 Euro and it costs 1292 euro per patient per year. The average improvement of HbA (1c) after the CSII introduction is 1.85. In the group treated while human insulin the average cost per children is 925 Euro and improvement of HbA (1c) human insulin is 0.28 for the same period. **CONCLUSIONS:** The treatment with CSII leads to significant improvement in glycemic control compared to the treatment with human insulin at the comparable costs.

PDB34

A COST ANALYSIS OF MEDICATION FOR PATIENTS WITH TYPE 2 DIABETES MELLITUS (T2DM) – HOW THIS VARIES ACCORDING TO BODY MASS INDEX (BMI) STATUS, AGE, GENDER AND CO-MORBIDITY

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OBJECTIVES: The rising prevalence of overweight and obesity has led to an increase in related metabolic disorders; most notably t2dm. We sought to determine how the cost of medication for this condition varies within a cohort of patients attending Galway University Hospital, according to age, gender, BMI and co-morbidity status. **METHODS:** We identified a subgroup of 185 adult type 2 diabetes patients attending our university hospital-based diabetes clinic, for whom detailed information about drug therapy and comorbidities (obesity, hypertension, dyslipidaemia) was available. We modelled the lifetime costs of medications for each patient, taking account of age, gender and comorbidity. The analysis compares the lifetime cost of medication of those patients who are obese relative to those who are overweight and of those with fewer to those with more co-morbidities; specifically obesity, hypertension and dyslipidaemia. **RESULTS:** We found that obesity is associated with a higher cost of medication relative to being overweight. Those with a BMI range of 35-39.9 had the highest mean cost of medication, costing on average €615 more than those who are overweight ($p < .01$). The highest cost of medication was associated with those aged 50-65- non-significant. Among those having all three co-morbidities compared to those having only t2dm there was a significant difference in the cost of medication costing on average an extra €418 ($p < .05$). **CONCLUSIONS:** These results suggest that the health economic costs associated with t2dm are differential with respect to the BMI status of affected individuals. These findings are of use in understanding the drug related burden of illness associated with obesity, t2dm and also the burden associated with being obese when one has t2dm compared to not being obese and having it. This study generated interesting data which will need to be replicated in larger prospective multicentre cohort studies.

PDB35

COST OF MICROVASCULAR AND MACROVASCULAR COMPLICATIONS IN PEOPLES WITH DIABETES TYPE 1 AND TYPE 2 IN BULGARIA

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OBJECTIVES: It has been shown that people with diabetes have a high prevalence of microvascular (neuropathy, nephropathy, retinopathy, diabetic angiopathy) and macrovascular (hypertension, stroke, myocardial infarction, heart failure and coronary artery disease) complications leading to hospitalizations. The objective of the present study is to evaluate the cost of hospitalizations due to micro- and macrovascular complications in an observed cohort of 433 patients with type 1 and 2 diabetes treated with insulin. **METHODS:** The evaluation is based on data from a 6 months combined retrospective and prospective observational study. People were separated in two groups depending on the type of diabetes and further into subgroups depending on the reason of hospitalization. The total costs for each subgroup of people were calculated and compared to the total costs of treatment for the observed period. **RESULTS:** In the group of people with type 2 diabetes (n=255) 128 people with complications were observed, whereas in people with type 1 diabetes it was only 70 people out of 178. The cost of hospitalizations in the type 2 diabetes group was in total 35 367 EUR for the people enrolled in the 6 months study with the following division of reported reasons: (general) diabetes- 43%, microvascular complications- 16%, and macrovascular complications- 41%. In the type 1 diabetes group the cost was equal to 15 364 EUR with the following split: 63% due to (general) diabetes, 19% due to microvascular complications, and 18% due to macrovascular complications. **CONCLUSIONS:** Type 2 diabetes is more costly than type 1 when hospitalizations occur. People with type 2 diabetes pay high cost for macrovascular complications than for microvascular probably due to high hypertension prevalence. The difference in costs between type 1 and 2 may result from different patients' characteristics.

PDB36

PHARMACOECONOMIC PECULIARITIES OF THYROID DISEASE TREATMENT IN UKRAINE

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OBJECTIVES: Due to the preparation for the transition to health insurance in Ukraine and because of the significant increase in thyroid disease it is important to assess a range of medicines included to the Ukrainian National Formulary (UNF). **METHODS:** It was compared the range of drugs for treatment of thyroid disease which are included to the Ukrainian National Formulary with the WHO Model list of Essential Medicines. Also it was calculated the annual cost of treatment by each medication considering the usual maintenance dose. **RESULTS:** In accordance to WHO Model List of Essential Medicines it was established that Ukrainian National Formulary includes thyroid hormones and antithyroid medicines for thyroid disease treatment such as: levothyroxine sodium and potassium iodide. Also it was found that there are no propylthiouracil medications in UNF. The dosage of levothyroxine sodium tablets satisfies the norms of World Health Organization, which are: 25 micrograms, 50 micrograms and 100 micrograms. Potassium iodide tablets in dose of 100 micrograms, 200 micrograms, 1 mg does not comply the norm. According to WHO Model list of Essential Medicines dosage of potassium iodide in tablets should be 60 mg. The cheapest annual cost of treatment by levothyroxine per patient is EUR 10,95 (The EUR/UAH conversion rate: 1 EUR = 10,52 UAH (Average 2013)), the most expensive is EUR 80,30. The most expensive annual cost of treatment by potassium iodide per patient is EUR 31,32, the cheapest is EUR 2,85. **CONCLUSIONS:** Propylthiouracil should be included to Ukrainian National Formulary. The cost difference of thyroid disease treatment by essential medicines caused by presence of foreign products in the pharmaceutical market of Ukraine.

PDB37

LOWER SHORT-TERM HEALTH CARE COST WITH THE ACCU-CHEK AVIVA EXPERT SYSTEM IN MULTIPLE DAILY INSULIN INJECTION (MDI) TREATED DIABETES PATIENTS - LEARNINGS FROM THE AUTOMATED BOLUS ADVISOR CONTROL AND USABILITY STUDY (ABACUS)

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OBJECTIVES: The randomized controlled ABACUS study assessed the impact of using the automated insulin bolus advisor within the Accu-Chek Aviva Expert system in combination with intensive diabetes therapy on glycemic control in patients treated with MDI therapy. This analysis assessed the potential incremental economic benefit of using this automated bolus advisor device on the short-term health care costs (SHC). **METHODS:** The study outcome parameter was "achieving the goal of an at least 0.5% reduction in HbA1c". The economic analysis was performed with a spreadsheet-model from a UK payer's direct cost perspective and based on ABACUS outcomes. Data on correlation between HbA1c change and expected cost are based on published literature. Model outputs include expected impact on SHC and sensitivity analysis. **RESULTS:** A total of 56% of patients in the intervention group (IG) achieved the goal, in the control group (CG) 34% respectively. Goal achievement led to an average HbA1c reduction of 1.2%, irrespective of group. There was no clinically relevant HbA1c effect in the remaining patients. Goal achievement correlates with an expected reduction in SHC of £189 per person / per year (PPY). The expected SHC reduction is £104 PPY in the IG and £74 PPY in the CG. The goal-achievement-rate increased by 63%, driving a comparative economic benefit of £30 PPY for an automated insulin bolus advisor supported approach. There were no significant differences in complications or in intervention cost. **CONCLUSIONS:** An MDI therapy in diabetes care that is supported by the Accu-Chek Aviva Expert systems with its automated bolus advisor leads to a 63% higher rate of goal achievement. This is expected to result in an incremental reduction in short-term health care costs of £30 PPY. Hence automated bolus calculation improved the cost-effectiveness of self-monitoring of blood glucose in this study population.

PDB38

FIRST RUSSIAN TYPE 2 DIABETES MELLITUS SIMULATION MODEL WITH DISCRETE EVENTS MODELING. HEALTH-ECONOMIC ANALYSIS

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OBJECTIVES: Type 2 diabetes mellitus (DM) is widely spread in Russia, counting about 10 million. New drugs are highly effective and carry a high cost for health care. The results of clinical trials are not enough to assess long term efficacy and safety of treatment. Modeling is a tool for making long term economic and outcome prognosis and comparing treatment strategies. The main goal of the presented study was to develop a predictive model of type 2 DM outcomes validated in Russian clinical conditions and to perform pharmacoeconomic evaluation of glucose lowering therapies. **METHODS:** Existing type 2 DM models were evaluated. Risk equations for type 2 DM complications were compiled from EAGLE and UKPDS DM models. Demographic (age, sex, height, weight, DM duration, smoking), biochemical (HbA1c, lipids) and clinical (blood pressure) patient parameters were used as inputs. Glucose lowering drug effectiveness was incorporated into