ABSTRACT

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Helsedirektoratet

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TITTEL PÅ PROSJEKTET: The effects of ethnicity and gender on the type 2 diabetes care in Norwegian general practice

EPOST: a.t.tran@medisin.uio.no | **TLF:** 470 25 899

Objective
To investigate the effects of ethnicity and gender on the type 2 diabetes (T2DM) care in Norway.

Methods
Population-based cross-sectional study identified 10 161 individuals with T2DM cared for by 282 General Practitioners (GP). Multilevel regression models adjusted for individual and GP factors were applied to evaluate ethnic differences by gender.

Result
Diabetes was diagnosed at a younger mean age in all other ethnic groups compared with Westerners (men: 45.9-51.6 years vs. 56.4 years, p<0.05; women: 44.9-53.8 years vs. 59.1 years, p<0.05). Daily smoking was more common among Eastern European, South Asian and Middle East/North African men. We found no ethnic differences in process of care such as GPs measurement of HbA1c, blood pressure, LDL-cholesterol, creatinine or albuminuria. The proportion who achieved the HbA1c treatment target was higher in Westerners (men: 62.3%; women: 66.1%), than in ethnic minorities (men 48.2%; women 53.5%). Compared with Western men, the odds ratio (OR) for achieving the target was 0.45, 95% CI (0.27 to 0.73) in Eastern Europeans; 0.67 (0.51 to 0.87) in South Asians; 0.62 (0.43 to 0.88) in Middle Easterners/North Africans. Compared with Western women, OR 0.49 (0.28 to 0.87) in Eastern Europeans: 0.64 (0.47 to 0.86) in South Asians. Compared with Westerners, the blood pressure target was more often achieved in South Asians and Middle Easterners/North Africans in both genders.

Conclusion
Several minority groups had earlier diabetes onset and worse glycaemic control compared with Westerners regardless of gender. Culturally and gender sensitive multi-faceted approach in the diabetes care are needed.

ABSTRACT NR 2

INNSENDER: Anna Kristine Follestad

FORFATTERE: **Anna Kristine Follestad**

ARBEIDSSTED Nidaros Velvære (+ bachelorstudent i bevegelsesvitenskap, NTNU)

TITTEL PÅ PROSJEKTET: Case, neuropathy patient given acupuncture and VAT, 2017

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Objective

Patient in her seventies with non-diabetic neuropathy, but prediabetes blood sugar levels since 2012. Reduced temperature -, tactile -, and vibration sensory function and joint movement in the underextremities (tested at St. Olavs, 2012). No tactile sensation from halfway down her legs. Hammertoes, Pes cavus, bad balance. Regulary resistance and cardio exercise. Pain not relieved using offered medicine. Facing operation to stiffen her toes.

Methods

Vibroacoustic therapy (VAT) was applied using Multivib mattress and Multivib Duo pillow and app with fixed programs combined with acupuncture. Starting with sessions three times a week, reducing to twice or once a week, and then once every second week. Programs: 40 Hz and special program composed by Olav Skille, main frequencies from 86 – 40 Hz. Length of sessions varying from 15 minutes to 46 (when applying to programs at one session). Cryotherapy was used to reduce increased neuropathic pain when tactile senses improved. Points of acupuncture and programs were noted, and periods of necessary stops in VAT treatment due to too much pain were logged.

Result

First starting to get a little relief from her pain, also her backpain. More cramps after a few sessions, slowly reducing again. Sleeping better when reduced leg cramps. At one stage she slept almost all night, waking up once or few times a night. Then both sleep quality was altered again due to more leg cramps and pain when introducing daily treatment of VAT at home using the Duo pillow in the beginning of her holiday and had to stop using it for two weeks. Better effect when introducing VAT with lower amplitude again combined with acupuncture, reduced cramps and pain. Able to perform a lot of work at her cottage (preparing for and painting it). Less pain in her shoulders even doing this work. Better able to pick up small pills from the plate without having used any acupuncture affecting the motoric in hand. Ability to stretch out her toes better was noticed by her daughter. Could join friends walking all day, not having to rest after a few hours walking. Slept without many cramps during night, and more able to perform a lot more everyday tasks. After 5 months able to feel the pressure of 10 g monofilament on 6 of 9 points. Generally feeling better, not wanting to be relieved from pain by not waking up any more. No longer need of operation, and for the first time in years able to put on new shoes.

Conclusion

Interesting findings in this case should be further studied to check the reliability of the method applied on a group of neuropathy patients. Testing standardized treatment intervals to avoid unbearable neuropathic pain when senses are returning, are important to obtain compliance from patients. If treatment shows to have effect on larger groups, it will have big impact on life quality and the possibilities to avoid ulcers due to reduced temperature-, tactile- and proprioceptive sensory loss.

INNSENDER: Anne Karen Jenum

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TITTEL PÅ PROSJEKTET: The effects of ethnicity and gender on the type 2 diabetes care in Norwegian general practice

EPOST: a.t.tran@medisin.uio.no | **TLF:** 470 25 899

Objective

We performed an individual participant data (IPD) meta-analysis of randomised controlled trials (RCTs) of lifestyle modification (LSM) using diet and/or physical activity to prevent diabetes in South Asians, as the effectiveness is unclear.

Methods

We searched 4 databases (to September 24th 2018), and obtained IPD on 1816 participants from all six eligible RCTs on LSM in South Asian adults. We generated hazard ratio (HR) estimates for incident diabetes and mean differences for fasting glucose, 2-hour glucose, weight and waist circumference, using mixed effects meta-analysis overall, and by pre-specified subgroups. We applied the GRADE system to rate the quality of evidence.

Result

Incident diabetes was observed in 118 of 932 (12.6%) participants in the intervention and 176 of 876 (20.0%) participants among controls. The adjusted HR was 0.65 (95% CI 0.51 to 0.82; I2=0%) in the intervention compared with controls; absolute difference 7.4% (95% CI 1 to 16), with no subgroup differences for sex, age, BMI, study duration or region. The GRADE quality of evidence was rated as moderate. Mean difference for intervention versus controls for 2-hour glucose was -0.35 mmol/l (95% CI -0.63 to -0.06; I2=51%); for weight -0.76 kg (95% CI -1.36 to -0.15; I2=72%) and for waist -1.16 cm (95% CI -2.15 to -0.17; I2=74%). Findings were similar across subgroups, except for weight by region. No effect was found for fasting glucose.

Conclusion

In high-risk South Asian populations, LSM interventions resulted in a 35% relative reduction in diabetes incidence, which was consistently present across pre-specified subgroups.

ABSTRACT NR 4

INNSENDER: Archana Sharma

FORFATTERE: **A.Sharma**, E. Qvigstad, C.Sommer, A.T. Tran, H.L. Gulseth, I. Nermoen, S.T. Sollid, K.I. Birkeland, C.Wium

ARBEIDSSTED: Forskningsenheten, Ahus

TITTEL PÅ PROSJEKTET: Diabetes in South Asians – The DIASA Research Programme

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Objective

Primary objectives:

To find effective methods to improve diabetes prevention and treatment in South Asians (SA).

Specific objectives:

DIASA 1: Estimate the prevalence of prediabetes (impaired glucose tolerance/impaired fasting glucose) and type 2 diabetes (T2D) in SA and Nordic (NO) women with prior gestational diabetes mellitus 1-3 years after childbirth. Study insulin- and glucose metabolism. Study perceptions about health, disease, risk factors that can facilitate-/hinder health promotion habits.

DIASA 2: Study differences between SA and NO women with prediabetes in liver and whole body insulin sensitivity, glucose- and lipid metabolism and fatty infiltration in liver.

DIASA 3: In SA women with pre-diabetes, test the effect of 4 oral antidiabetic agents on glucose-/lipid metabolism and on fatty liver.

DIASA 4: To establish and follow a SA T2D cohort in the General Practice. Assess glucose regulation, treatment and complications. Perform an intervention in General Practitioners to improve diabetes treatment strategies

DIASA 5: Study attitudes towards treatment and adherence.

DIASA 6: Test the best treatment from DIASA 3 against Standard of Care in a RCT (randomized controlled intervention trial) in patients with T2D in General Practice.

Methods

A research programme ongoing both in hospitals and general practice, combining quantitative and qualitative research methods in cross-sectional observational studies, prospective cohort studies and RCT`s.

Result

The Research is ongoing. No results are available.

Conclusion

The DIASA Programme will provide knowledge which can be used to develop more targeted treatment of T2D in SA, and more successful strategies for prevention of diabetes development.

INNSENDER: Egil Midtlyng

FORFATTERE: **Kristin A. Bakke overlege** [1], Egil Midtlyng psykologspesialist[1], Torild Skrivarhaug, PhD og overlege[2].

ARBEIDSSTED [1]Nasjonalt kompetansesenter for autisme, ADHD, Tourettes syndrom og hypersomni, [2]Nasjonalt medisinsk kvalitetsregister for barne- og ungdomsdiabetes. Oslo universitetssykehus

TITTEL PÅ PROSJEKTET: ADHD hos barn og unge med Type 1 diabetes – en ny og undervurdert utfordring?

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Objective

Prosjektet skal skaffe erfaringer om dobbeltdiagnosen ADHD og type 1 diabetes (T1D). Behandling av T1D setter store krav til organisering og planlegging og personer med ADHD, har en medfødt funksjonsvanske knyttet til organisering og planlegging. Nyere studier har vist at barn og unge med både ADHD og T1D har høyere HbA1c (langtidsblodsukker) og flere episoder med ketoacidose (KDA) og hypoglykemi enn de som bare har T1D.

Pasienter med ADHD rapporterer mer stress og depressive symptomer som følge av negative sanksjoner. En svensk studie viser at for pasienter med T1D og ADHD er dette spesielt knyttet til manglende måloppnåelse i diabetesbehandlingen.

Ved Oslo universitetssykehus er det satt i gang en studie for å finne pasienter som har begge diagnosene i Norge, og samle data om diabetesforløp, behandling for ADHD og livskvalitet med tanke på psykisk helse og oppfølging fra helsevesenet. ADHD forekommer omtrent like ofte blant personer med T1D som ellers i befolkningen.

Methods

Barn og unge med både T1D og ADHD og deres pårørende får et tilbud om deltakelse i et psykoedukativt kurs som arrangeres for første gang for barn og unge med begge diagnosene, eller ved et tilbud om bare å delta i en oppfølgingsstudie.

Result

16 pasienter med pårørende deltar på kurset i april. Ytterligere personer vil senere bli inkludert i studien.

Conclusion

Erfaringer fra kurset vil bli brukt i forbindelse med videre planlegging av inkludering og datainnsamling og til å lage en kunnskapsoppsummering.

ABSTRACT NR 6

INNSENDER: Elisabeth Iversen

FORFATTERE: **Iversen E**, Kolltveit BCH, Hernar I, Mårtensson J, Haugstvedt A

ARBEIDSSTED: Haukeland universitetssykehus, Høgskulen på Vestlandet, Jönköping universitet

TITTEL PÅ PROSJEKTET: Young adults with type 1 diabetes and their experiences with the transition from paediatric to adult care

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Objective
We aimed to explore how young adults with type 1 diabetes (T1D) experienced the transition from paediatric to adult diabetes care services.

Methods
We used an applied inductive approach known as Interpretive Description (ID), in order to design the study, and collect and analyse the data. ID is inspired by grounded theory, ethnography and phenomenology, and is specifically designed to explore phenomena in clinical practice aiming to generate new knowledge and skills. Data was gathered by interviewing eleven young adults with T1D (aged 19-23 years) receiving adult care at Haukeland university hospital.

Result
We identified four main themes regarding the young adults' experiences of the transfer from paediatric to adult diabetes care: (i) limited information about the transition; (ii) transition from a frequent, thorough and personal follow-up to a less comprehensive and less personal follow-up; (iii) the importance of being seen as a whole person; and (iv) limited expectations of how the health care services were organised.

Conclusion
The study showed that the existing routines for transfer between paediatric and adult care are not optimal. The participants expressed that they were not prepared for the dissimilarities in follow-up and were predominantly less pleased with the adult care follow-up. The findings indicate a need for structured transition programmes that contribute to young adults with T1D receiving a safe and positive transition at an otherwise demanding life phase. Young peoples' individual needs for the transition to and follow-up in adult care may be promoted by an approach based on person-centred care.

INNSENDER: Frode Kristensen

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TITTEL PÅ PROSJEKTET: The Eyes have it, but do the feet? «På godfot med synssansen»

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Objective

Diabetes foot ulcer and diabetic retinopathy are both serious late complications of diabetes. National and international guidelines recommend regular examination of feet and eyes. The aim of this study was to explore management of feet and eyes in patients with type 1 and type 2 diabetes in Norway.

Methods

The study had a descriptive design. Data was collected using a standard questionnaire.

Result

Data from 833 patients was analyzed, 60 % were female and 58 % had type 2 diabetes. In the course of their last five primary doctor visits, the participants were examined by from one to five doctors. In all, 183 (22 %) had their feet examined on a regular basis and 675 (81 %) had regular eye examinations. On the average feet were examined every 7th to 8th month, ranging from 0 to 24 months, and the eyes were examined every 13 months, ranging from 0 to 48 months.

A total of 221 (21 %) had complications arising from diabetes, 20 % had foot ulcers and 9 % laser-treated retinopathy. Foot ulcers were associated with age (rs= -0.080, p=0.005), while laser treatment was associated with the duration of diabetes (rs=0.328, p 0.001) and type 1 diabetes (rs = -0.126, p<0.001).

Conclusion

For the majority of patient's prevention and monitoring of diabetic retinopathy meet the intention of the national guidelines, but feet are treated differently and need a more systematic approach to reach the guideline goals.

ABSTRACT NR 8

INNSENDER: Hanne L Gulseth

FORFATTERE: **Hanne L. Gulseth**[1], Johan Bodegard[2], Søren Tang Knudsen[3], Frederik Persson[4], Kristian Furuseth[5], Marcus Thuresson[6], Anders Lindh[7], Michael Alvarsson[8], Marit Eika Jørgensen[1], Jens Søndergaard[9], Kåre I. Birkeland4, Peter M. Nilsson[10]

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TITTEL PÅ PROSJEKTET: Proportion of patients reaching HbA1c targets related to second-line treatment initiation: a Nordic observational study comparing type 2 diabetes management in primary care

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Background and Aims

Second line treatment with glucose lowering drugs (GLD) is an important part of type 2 diabetes (T2D) management. Previous research has shown that the Nordic countries differ with respect to proactivity when initiating second-line treatment, despite that guidelines argue for early intervention of uncontrolled HbA1c. The aim of this study was to describe proportion of patients successfully below HbA1c target levels below 47.5 mmol/mol (DCCT 6.5%), 53 (7.0) and 58.5 (7.5) at initiation of second-line and up to 5 years after using data from Denmark (DK), Norway (NO) and Sweden (SE).

Materials and Methods

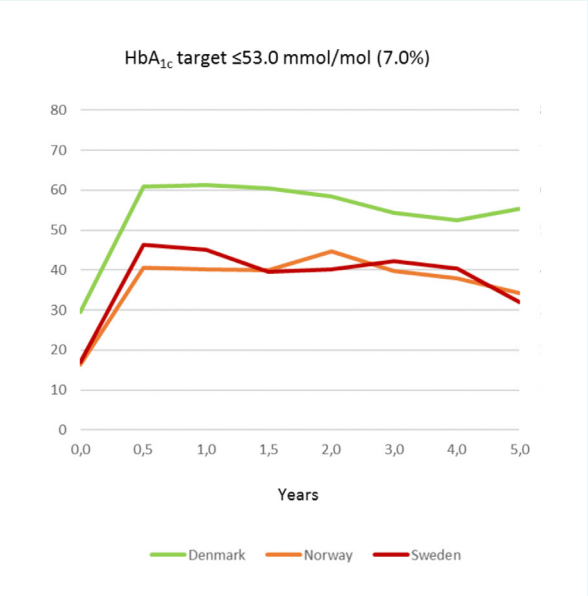
Electronic medical records (EMR) data on T2D patients was extracted from 60 primary care clinics in DK, NO and SE, and linked with national Prescribed Drug-, National Patient- and Cause of Death Registry data in respective country. Second line treatment (index date) was defined as dispense of new GLD class after ≥6 months metformin monotherapy.

Result

Between 2010-2015, 2861 patients were identified in DK, NO and SE; 646, 635 and 1580 patients, respectively. Mean age 60, 62 and 64 years; females 42, 42 and 39%; established CVD 19, 21 and 26%; and chronic kidney disease 1, 4 and 3%, respectively. Use of sulphonylurea and insulin as second line treatment was 2-fold greater in SE compared with NO and DK. In 2015, the greatest initiation of either DPP-4i, SGLT-2i or GLP-1a was observed in DK (70%) and NO (75%) compared to SE (48%). At index date, DK had the lowest HbA1c (61.7 mmol/mol, 95%CI [59.6-62.8]) compared to NO (67.2 [65.0-68.3]) and SE (66.1 [63.9-67.2]). In DK, initiation of second-line treatment showed the greatest proportion with HbA1c below all targets compared to NO and SE (Figure). During follow-up, the proportion of patients below targets was also greatest in DK compared to the other countries. Norway and Sweden demonstrated similar target patterns.

Conclusion

Despite similar demographics and health care systems in three Nordic countries, we have shown marked differences in drug treatment patterns and HbA1c target strategies related to second-line treatment. In Denmark, second-line treatment was initiated earlier, i.e. in patients with lower mean HbA1c, which also resulted in an observed better glycaemic control over the next two years compared to Norway. These observations may indicate a more proactive disease management in the included general practices in Denmark in a primary care setting compared to the other countries.



ABSTRACT NR 9

INNSENDER: Ingmar Näslund

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TITTEL PÅ PROSJEKTET: The effect of diabetes duration on remission after bariatric surgery

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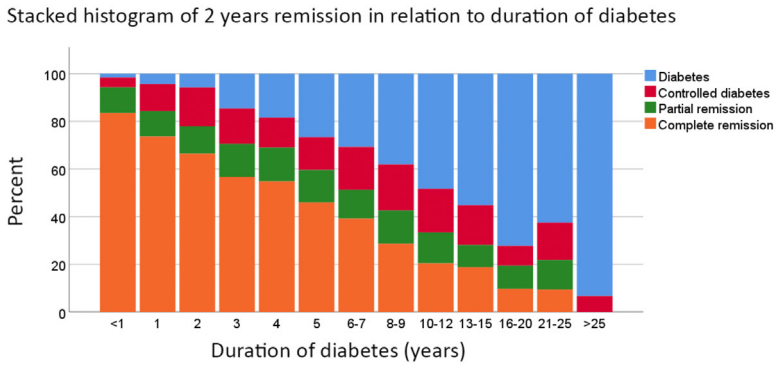
Objective
To evaluate the impact of bariatric surgery on type 2 diabetes (T2DM) remission depending on diabetes duration.

Methods
Patients operated with primary sleeve gastrectomy or gastric bypass in Sweden from 2007 until 2015 were assessed for eligibility. T2DM in accordance with the definition of the American Diabetes Association (ADA) was considered criteria for inclusion. The study was based on data from the Scandinavian Obesity Surgery Registry, the Swedish National Patient register and the Swedish Prescribed Drug Register.

Result
In total, 8546 patients with T2DM were included in the study. The proportion of patients being free from diabetes medication at 2 years was 76.6% (n=6499), and 69.9% at 5 years (n=3765). The chance of being free from diabetes medication was lower with longer duration of diabetes both at 2 years (OR 0.80/year, 95%CI 0.79-0.81, p<0.0001, Spearman coefficient 0.43, p<0.0001), and 5 years after surgery (OR 0.76/year, 95%CI 0.75-0.78, <0.0001, Spearman coefficient 0.48, p<0.0001). Complete remission of diabetes (ADA-criteria) was achieved for 58.2% (n=2090) at 2 years, and 46.6% at 5 years (n=681).The chance of reaching complete remission was also reduced with the duration of diabetes both at 2 years (OR 0.78/year, 95%CI 0.76-0.79, p<0.0001, Spearman coefficient 0.46, p<0.0001) and 5 years after surgery (OR 0.77/year, 95%CI 0.74-0.80, p<0.0001, Spearman coefficient 0.44, p<0.0001).



Conclusion
The remission of T2DM after bariatric surgery correlates to diabetes duration and is highest among patients with more recent onset.

INNSENDER: Ingun Toftemo

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TITTEL PÅ PROSJEKTET: BMI trajectories from birth to 4-5 years in a Norwegian Multi-Ethnic population; Associations with maternal gestational diabetes, prepregnant obesity and gestational weight gain

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Objective

Maternal gestational diabetes (GDM) has been associated with offspring BMI in older-, but not in small children. We examined associations between maternal GDM and children's BMI trajectories from birth to 4-5 years, and the influence of prepregnant obesity and gestational weight gain (GWG).

Methods

In the population-based STORK Groruddalen cohort, followed from early pregnancy and all screened for GDM, we collected child anthropometrics from seven time-points between birth and 4-5 years of age (346 ethnic Europeans, 181 South Asians, and 152 Middle East/North Africans). Using mixed models, we studied associations between maternal factors and children's BMI (kg/m2) and changes in BMI (growth) per month. We analyzed growth intervals 0-6 months and 6 months to 4-5 years separately.

Result

Children exposed to GDM were not heavier at birth but had slower BMI growth (B=-0.120 SD; 95%CI: -0.18- -0.04) during the first 6 months, and faster BMI growth from 6 months to 4-5 years (B=0.009 SD; 95%CI: 0.002-0.02) compared to children not exposed, until their BMI was similar at 4-5 years. Maternal prepregnant obesity was associated with higher BMI at birth, and stable higher BMI up to 4-5 years. Maternal GWG (highest tertile) was associated with higher BMI at birth and faster BMI growth from 6 months to 4-5 years (B=0.007 SD; 95%CI: 0.0002-0.01). Although there were substantial ethnic differences in BMI trajectories, relations with maternal GDM, prepregnant obesity and GWG were similar in all ethnic groups. The effects of the three maternal factors were largely independent of each other.

Conclusion

Maternal gestational diabetes, prepregnant obesity and gestational weight gain had different and independent effects on the child's BMI trajectories.

ABSTRACT NR 11

INNSENDER: Ingvild Hernar

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TITTEL PÅ PROSJEKTET: Routine assessment of Patient-Reported Outcome Measures (PROMs) in the DiaPROM trial

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Objective

We aimed to [1]investigate willingness to complete patient-reported outcome measures (PROMs) on a touchscreen computer in the outpatient clinics' waiting area, 2estimate the proportion of participants with elevated scores in need of further follow-up, and 3examine the association between diabetes-related distress and psychological well-being.

Methods

We recruited 149 adults (18-74 years) with type 1 diabetes to complete PROMs on a touchscreen computer at Haukeland University Hospital's diabetes outpatient clinic. We used the Problem Areas in Diabetes Scale (PAID) and the WHO-5 Well-being Index (WHO-5) to examine diabetes-related distress and psychological well-being. A PAID score ≥40 suggest serious diabetes-related emotional problems whereas a score of ≥30 or minimum one item scored ≥3 qualify for extra follow-up. WHO-5 scores ≤50 indicate suboptimal psychological well-being and scores ≤28 suggest depression.

Result

One-hundred twenty (80.5%) participants were to at least a large degree willing to complete PROMs electronically. PAID scores of concern were reported by 74 (49.7%) participants, of which 26 (17.5%) scored ≥40. Forty-one (27.5%) reported suboptimal well-being, while nine (6.0%) reported scores suggesting likely depression. We found a moderate correlation (rho = - 0.48, P <.001) between increased diabetes-related distress and reduced psychological well-being.

Conclusion

The majority of participants reported willingness to complete electronic PROMs in the outpatient waiting area. Half of them reported moderate to serious diabetes-related distress and about one-fourth reported suboptimal psychological well-being. Using PROMs may help clinicians to identify emotional problems and to become aware of diabetes-related challenges and thus to facilitate targeted follow-up in forthcoming studies.

INNSENDER: Kjersti Nøkleby

FORFATTERE: **Kjersti Nøkleby**, Tore Julsrud Berg, Tor Claudi, Sverre Sandberg, John G. Cooper, Anne Karen Jenum

ARBEIDSSTED: Avd for allmennmedisin, UiO

TITTEL PÅ PROSJEKTET: Variation in performance of processes of care for type 2 diabetes patients in primary care

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Objective

There is limited knowledge on the variation in GPs' quality of care. We explored the variation between GPs in their performance of six recommended procedures in type 2 diabetes patients.

Methods

The ROSA 4 study is a cross-sectional study of the quality of care for diabetes patients in Norwegian general practice in 2014. As a measure of quality, we constructed a sum score on GP level, reflecting whether a GP had performed six recommended procedures in her type 2 diabetes patients. These procedures are measurements of HbA1c, LDL, blood pressure, albuminuria, and recorded foot examination last 15 months, and documented retinopathy screening last 30 months. Based on the sum score, the GPs were divided in quintiles. A multilevel ordinal logistic regression model was fitted to identify factors associated with being in a quintile with better performance.

Result

We identified 6015 type 2 diabetes patients under 75 years without cardiovascular disease, from 275 GPs in 77 practices. Adjusting for GP factors and aggregated patient factors, preliminary results show that the strongest association with being in a better quintile was the use of a structured follow-up form. Being a GP specialist and having routines for patient reminders were also associated with better performance, whereas heavier workload and GPs' age above 60 years were associated with a poorer performance. Inclusion of patient factors in the model altered results negligibly.

Conclusion

There is a consistent pattern of variation in GPs' performance of process care, where factors reflecting structure and workload seem to matter.

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TITTEL PÅ PROSJEKTET: Cross-sectional study of annual glycaemic control between 2003 to 2015 in primary care: Management of type 2 diabetes patients in the Nordic countries

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Objective

The Nordic countries have nationwide public primary health care systems. Although guidelines argue for treatment intensification at uncontrolled HbA1c, there are country specific differences in T2D treatment guidelines and this might be reflected in differences in glycaemic control. The aim of this study was to describe the annual proportion of patients successfully below HbA1c target levels below 47.5 mmol/mol (DCCT 6.5%), 53 (7.0%) and 58.5 (7.5%) during 12-years using data from Denmark, Norway and Sweden.

Materials and Methods

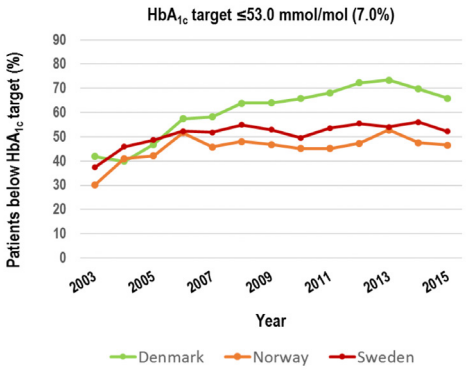
Electronic medical record data were extracted from 60 primary care clinics in Denmark, Norway and Sweden comprising all patients having a diabetes diagnosis and/or prescription of any glucose lowering drug during 2003-2015. Patients with T1D and gestational diabetes were excluded. The study used a cross-sectional method analysing the HbA1c annually from 2003 to 2015.

Result

In 2015, a total of 20,183 T2D patients were identified in Denmark (3909), Norway (3706) and Sweden (12,568). Mean age 66, 65 and 70 years; females 45, 45 and 42%; previous myocardial infarction 8, 8 and 10%; and chronic kidney disease 6, 10 and 7%, respectively. Use of newer GLDs (DPP-4i, GLP-1RA and SGLT-2i) was highest in Norway, followed by Denmark and lastly Sweden. In 2015, the proportions of T2D patients below HbA1c 47.5 mmol/mol was 42%, 29% and 27% in Denmark, Norway and SE respectively (Figure showing for target 53 mmol/mol). Denmark also showed similar beneficial patterns for HbA1c targets below 53.0 and 58.5 mmol/mol compared with the other countries (Figure). Also, the proportion of patients with HbA1c above 70.0 mmol/mol was lower in Denmark, in 2015 9.9% vs 13.4% and 15.0% in Norway and Sweden respectively. From 2003 to 2015, we found that Norway and Sweden had an initial improvement of patients below targets over the first - while remaining unchanged over the next years, whereas Denmark has showed continuous improvement during the whole observation period.

Conclusion

Despite similar demographics and health care systems in three Nordic countries, we have shown marked better glycaemic control in Denmark as compared to Norway and Sweden. This may indicate a more proactive disease management in the general practices included for this observational study, and also point out potential areas of improvement in the management of type 2 diabetes patients particularly in Norway and Sweden.



INNSENDER: Maryam Saeed

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TITTEL PÅ PROSJEKTET: Cardiovascular disease and end-stage renal disease in type 1 diabetes with onset before 15 years of age and long duration

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Objective

Type 1 diabetes (T1D) is among the most prevalent chronic pediatric disorders with approximately 350 new cases diagnosed in Norway annually. Both coronary heart disease (CHD) and renal disease are major long-term complications of T1D and well-known risk factors for premature mortality. The risk of CHD and death caused by CHD is nearly halved during the last decades in the general population, but Norwegian data on these trends in T1D has been lacking. In the current PhD-project, we aim to estimate the cumulative incidence of CHD in patients with T1D diagnosed before 15 years of age and compare this to the general population. Secondary aims are to study risk factors for end-stage renal disease (ESRD) and to test whether circulating markers of inflammation including high sensitivity C-reactive protein is associated with CHD in a subgroup of 299 patients with T1D.

Methods

The material is register based with newly diagnosed T1D in the National Childhood Diabetes Registry (NCDR) 1973-2017 (N=9312 cases) and ten matched control persons per case, selected from the National registry. Follow-up period was maximum 44 years.

Subjects were followed from diagnosis of T1D until censor 31 December 2017. Date of CHD registered in specialist care (hospitalization) was obtained from cardiovascular disease of Norway (CVDNOR), the Norwegian Patient Registry and the Norwegian Kidney Registry. Date of fatal CHD outside hospital was retrieved from Cause of Death Registry. Ethnicity and educational status was obtained from Statistics Norway.

Result

The necessary permission from all the registries has been obtained and data linkage is ongoing. Preliminary data show that among subjects (n = 102 432) included (T1D cases and controls together), 132 patients developed ESRD and 500 have had aCHD recorded. CHD death was recorded for 64 persons (13 with T1D and 51 without).

Conclusion

While we have not completed the analysis by the time of submission of this abstract, the preliminary results support our a priori power calculations and that we will have sufficiently high number of CHD and ESRD events to reliably estimate the cumulative risk of these complications in the T1D patients and matched controls.

INNSENDER: Mirjam Lukasse

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TITTEL PÅ PROSJEKTET: Gravid+ prosjektet: Knowledge of gestational diabetes mellitus at first consultation in a multi-ethnic pregnant population in the Oslo region – a cross-sectional study

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Objective

The aim of this study was to investigate knowledge of GDM among a multi-ethnic pregnant population at first consultation for GDM in the Oslo region.

Methods

We conducted a cross-sectional study using baseline data from a randomised controlled study performed at five diabetic outpatient clinics (DOC) in the Oslo region. Pregnant women diagnosed with GDM following an Oral Glucose Tolerance test (OGTT) with a 2-hours blood glucose level of ≥ 9 mmol/l were included. Women filled out a questionnaire on an electronic tablet at the study entry, and additional data was collected through a recruiting form.

Result

Of 238 women included in the study, 108 (45.4%) were native Norwegian speakers and 130 (54.6%) were non-native Norwegian speakers. 39.5% of the non-native Norwegian speakers were Asian, 22.5% were African, and 15.5 % were from Eastern European Countries. Non-native Norwegian speakers were significantly more likely to have poor knowledge of GDM compared to native Norwegian speakers, adjusted OR = 4.5, 95% CI 1.61–12.5. Sensitivity analyses showed this was not due to poor language skills.

Conclusion

Ethnic background was associated with level of knowledge of GDM. Health professionals should be aware of the various knowledge levels concerning GDM and tailor their information towards women's knowledge. Linguistically- and culturally-adapted information regarding GDM may improve knowledge gaps among women with immigrant backgrounds.

ABSTRACT NR 16

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TITTEL PÅ PROSJEKTET: Maternal and child gluten intake and risk of type 1 diabetes: The Norwegian mother and child cohort study.

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Objective
To examine the association between the maternal gluten intake during pregnancy, child's gluten intake at age 18 months, and the risk of type 1 diabetes (T1D) in the child.

Methods
We included 86,306 children in The Norwegian Mother and Child Cohort Study born from 1999 through 2009, followed to April 15, 2018. The outcome was clinical T1D, ascertained in a nation-wide childhood diabetes registry. Hazard ratios (HR) were estimated using Cox regression for the exposures maternal gluten intake during pregnancy and child's gluten intake at 18 months. We derived the amount (g/d) of gluten intake from a semi-quantitative food frequency questionnaire at week 22 of pregnancy and from a questionnaire completed by the guardian when the child was 18 months old.

Result
During a mean follow-up of 12.3 years (range 0.7-16), 346 children (0.4%) developed T1D (incidence rate 32.6 per 100,000 person-years). The average gluten intake was 13.6 g/d for mothers during pregnancy, and 8.8 g/d for the child at 18 months of age. Maternal gluten intake in mid-pregnancy was not associated with development of T1D in the child (aHR 1.02 (95%CI 0.73-1.43) per 10 g/d increase in gluten intake). However, the child's gluten intake at 18 months of age was associated with an increased risk of developing T1D (aHR 1.46 (1.06-2.01) per 10 g/d increase in gluten intake).

Conclusion
This study suggests that the child's gluten intake at 18 months of age, and not the maternal intake during pregnancy, could increase the risk of T1D in the child.

INNSENDER: Pernille Svalastoga

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TITTEL PÅ PROSJEKTET: Children with KATP Channel Neonatal Diabetes Display Cognitive Impairment with the V59M Genotype Exhibiting Increased Vulnerability Proving Strongly Associated with Considerate Intellectual Disability

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Objective

Although recent studies have presented high neuropsychiatric morbidity in neonatal diabetes and a genotype-phenotype relationship has been reported, the impact of the different mutations on intellectual functioning has not yet been fully assessed. Specifically, children with severe neurological features have only been partly investigated. We therefore assessed the mental health of all Norwegian KATP channel neonatal diabetes patients.

Methods

Eight children with KATP channel neonatal diabetes, of which five carried the V59M genotype, were assessed and compared with age-matched controls with type 1 diabetes. The investigations included a physical- and motor developmental examination, cerebral MRI, psychometrical questionnaires and -tests assessing intellectual capabilities.

Result

The V59M genotype displayed cognitive abilities corresponding to moderate disorder of intellectual development generating a burden of associated comorbid conditions. Other genotypes were also affected but to a lower extent with the subjects displaying borderline intellectual dysfunction and nonverbal learning disability, all diagnosed with attention deficit hyperactivity disorder (ADHD). Cerebral MRI verified normal brain anatomy in all but one that showed white matter lesions of uncertain clinical significance.

Conclusion

A genotype-phenotype relationship has previously been proposed, and this study is the first to present the V59M mutation's considerable impact on intellectual performance, all demonstrating intellectual capabilities corresponding to moderate disorder of intellectual development. The results were highly significant for this genotype even with the limited sample size. Coinciding with recent studies demonstrating cognitive impairment also for other genotypes, subjects that were carriers of other mutations than V59M also displayed minor cognitive impairments, but not sufficient to generate a diagnosis of intellectual disability.

INNSENDER: Øystein Jensen

FORFATTERE: **Øystein Jensen**, Tomm Bernklev, Charlotte Gibbs, Ragnar Bekkhus-Moe, Dag Hofsø, Lars-Petter Jelsness-Jørgensen

ARBEIDSSTED: Høgskolen i Østfold, Sykehuset Vestfold, Sykehuset Telemark, Sykehuset Østfold og Universitetet i Oslo

TITTEL PÅ PROSJEKTET: Kronisk fatigue er assosiert med signifikant reduksjon av helserelatert livskvalitet (HRQoL) ved type 1 diabetes.

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Objective

Formålet med studien var å undersøke om det er en sammenheng mellom kronisk fatigue (KF) og helserelatert livskvalitet (HRQoL) ved type 1 diabetes (T1D), med tilsvarende data fra norsk bakgrunnspopulasjon som referanse.

Methods

Pasienter med T1D ble inkludert i forbindelse med rutinemessig oppfølging ved tre poliklinikker i Norge i perioden 2015-2016. Sosio-demografiske og kliniske data ble innsamlet. Fatigue ble målt med «The Fatigue Questionnaire (FQ)». Enkeltscore for de første 11 spørsmålene i FQ ble dikotomisert, slik at score 0 eller 1 fikk score 0, og score 2 eller 3 fikk score 1. KF er definert som kombinasjonen av en dikotomert score ≥4 kombinert med en symptomvarighet på ≥6 måneder. Generisk HRQoL ble målt ved Short-Form 36 (SF-36) og sykdomsspesifikk HRQoL ved Diabetes Health Profile-14 (DHP-14). ANCOVA ble brukt for å kontrollere for mulige konfoundere. Effektstørrelse ble beregnet med Cohen`s d.

Result

288 pasientene ble inkludert. Kvinner/Menn = 152/136, gjennomsnittlig alder kvinner/menn = 44,6/45,0 år. 76 pasienter (26.4%) rapporterte KF. T1D-pasienter uten KF hadde SF-36 verdier tilsvarende norsk bakgrunnspopulasjon. Pasienter med KF hadde statistisk signifikant redusert SF-36 skår i alle åtte dimensjoner ($p < 0.001$), samt statistisk signifikante forhøyede score i alle tre DHP-14 dimensjoner ($p < 0.02$), sammenlignet med T1D-pasienter uten KF. Justering for relevante kovariater endret ikke dette funnet. Cohen's d viste medium til store effektstørrelser (0,72-1,35) i alle SF-36 dimensjoner, med store endringer for 5 av 8 dimensjoner. Effektstørrelsene for DHP-14 var små til middels (0,31 - 0,69).

Conclusion

KF er assosiert med statistisk signifikant reduksjon i både generisk og sykdoms-spesifikk HRQoL. Det er ingen statistisk signifikant forskjell i SF-36 verdier mellom norsk bakgrunnspopulasjon og pasienter med T1D uten KF.

Design: www.bly.as

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