MICRO LABS LIMITED

Diabetes Update

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Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you **"DIABETES UPDATE"** which contains latest and interesting news in the field of Diabetes and Endocrinology.

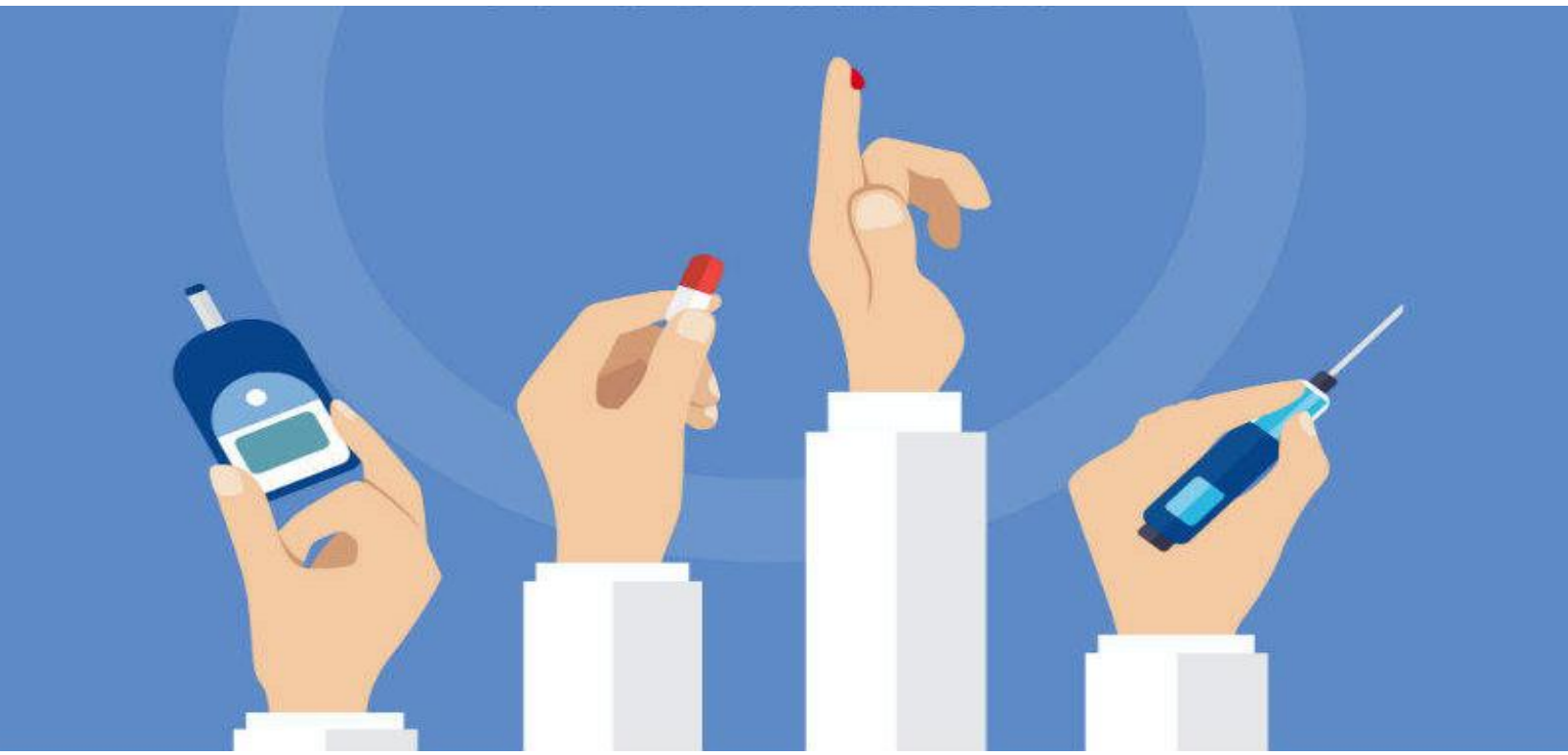
- The impact of type 2 diabetes and its management on the prognosis of patients with severe COVID-19
- Post pancreatitis Diabetes Confers Higher Risk for Pancreatic Cancer Than Type 2 Diabetes: Results from a Nationwide Cancer Registry
- The Association Between HbA1c and Time in Hypoglycemia During CGM and Self-Monitoring of Blood Glucose: GOLD-4 Study

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Limited



The impact of type 2 diabetes and its management on the prognosis of patients with severe COVID-19

People with type 2 diabetes (T2DM) appear to have a higher risk for SARS-CoV-2 infection with a prevalence. Although T2DM patients with COVID-19 develop a more severe condition compared to those without diabetes, the mechanisms for this are unknown. Moreover, the impact of treatment with anti-hyperglycemic drugs and glucocorticoids is unclear.

From 1584 COVID-19 patients, 364 severe/critical COVID-19 patients with clinical outcome were enrolled for the final analysis and patients without pre-existing T2DM but elevated glucose levels were excluded. Epidemiological data were obtained and clinical-status evaluation carried out to assess the impact of T2DM and its management on clinical outcomes. Of 364 enrolled severe COVID-19 inpatients, 114 (31.3%) cases had a history of T2DM. 27(23.7%) cases died in T2DM patients, who had more severe inflammation, coagulation activation, myocardia injury, hepatic injury, and kidney injury, compared with non-DM patients. In severe COVID-19 patients with T2DM, we demonstrate a higher risk of all-cause fatality with glucocorticoid treatment (Adjusted HR, 3.61; 95%CI, 1.14-11.46; P = 0.029), and severe hyperglycemia (FPG ≥11.1 mmol/L) (Adjusted HR, 11.86; 95%CI, 1.21-116.44; P = 0.034). T2DM status aggravated the clinical condition of COVID-19 patients and increased their critical illness risk. Poor fasting blood glucose (≥ 11.1 mmol/L) and glucocorticoid treatment are associated with poor prognosis for T2DM patients with severe COVID-19.

Poor fasting blood glucose and glucocorticoid treatment are associated with poor prognosis for T2DM patients with severe COVID-19

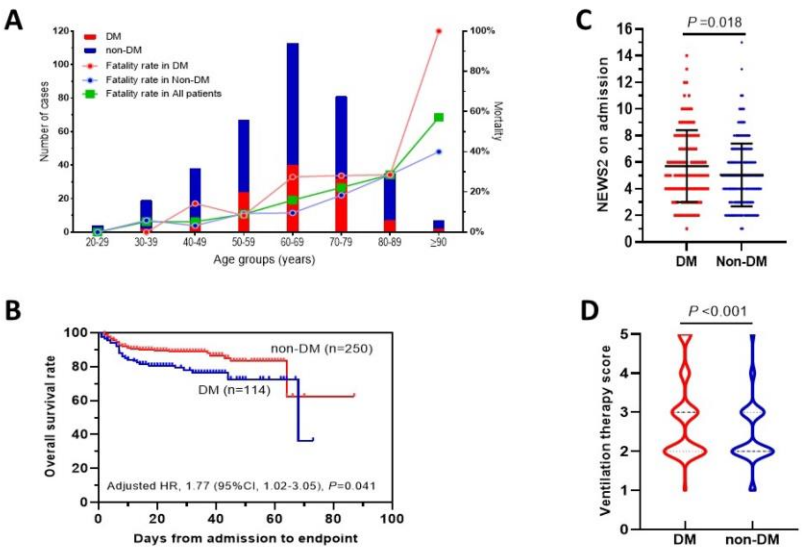


Fig. 2: The effects of type 2 diabetes and age on the prognosis of patients with COVID-19 A)The effects of type 2 diabetes (DM) vs. non-diabetes (non-DM) on the mortality of COVID-19 patients with severe/critical infection in the different age groups; B) The overall survival rate of DM vs. non-DM; C) The NEWS2 on admission of DM vs. non-DM and D) The ventilation therapy score of DM vs. non-DM. p<0.05 is considered as significant and its value is as indicated in the graph.

Diabetes has been suggested that confers worse prognosis on COVID-19. A history of T2DM aggravated the clinical status of COVID-19 patients, increased their critical illness and mortality rates. SARS-CoV-2 infection in diabetes led to more severe inflammation, coagulation activation, myocardia injury, hepatic injury, and kidney injury. GC treatment and fasting plasma glucose ≥11.1 mmol/L were found to be risk factors for fatality in diabetes patients with COVID-19. There are some limitations of this study that took place within the context of an emergency outbreak including: lack of a control group- either as a matched control to compare patient groups or randomized control for the assessment of treatments. Besides, this study is based on small

numbers of diabetic patients. However, our study provided evidence for informing clinical decisions.

Source: Xu et al J Diabetes. 2020 July; [online ahead of publication] https://doi.org/10.1111/1753-0407.13084

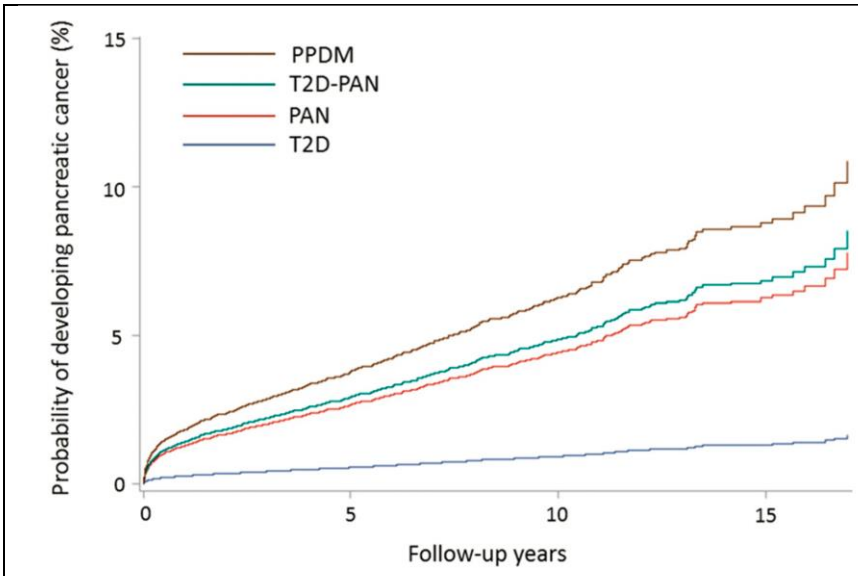
Post pancreatitis Diabetes Confers Higher Risk for Pancreatic Cancer Than Type 2 Diabetes: Results From a Nationwide Cancer Registry

Pancreatic cancer is one of the leading causes of cancer-specific mortality, with a 5-year survival rate of <10%, and it is projected to become the leading cause of cancer deaths by 2050. Pancreatitis and diabetes are established risk factors for pancreatic cancer. However, to date, studies have investigated only the risk associated with either of them alone. The aim of this study was to investigate the effect of pancreatitis and diabetes combined, as well as their temporal relationship, on the risk of pancreatic cancer.

Nationwide cancer registry was linked to hospital discharge and mortality data from 1998 to 2015 in New Zealand. Incidence of primary pancreatic cancer in the four study groups (type 2 diabetes [T2D] alone, pancreatitis alone, T2D followed by pancreatitis, and postpancreatitis diabetes mellitus [PPDM]) was identified. Multivariable Cox regression analyses were conducted, with T2D as the reference group. A head-to-head comparison between the T2D followed by pancreatitis and PPDM groups was also performed.

Pancreatitis significantly increases the risk of pancreatic cancer in individuals with diabetes. In particular, PPDM poses the highest risk for pancreatic cancer.

Among 139,843 individuals (735,541 person-years), 913 (0.7%) were diagnosed with pancreatic cancer. The proportion of pancreatic cancer was 3.1%, 2.3%, 2.0%, and 0.6% in individuals with PPDM, T2D followed by pancreatitis, pancreatitis alone, and T2D alone, respectively. PPDM (hazard ratio [HR] 6.94; 95% CI 4.09–11.77) and T2D followed by pancreatitis (HR 5.35; 95% CI 3.52–8.14) were associated with significantly higher risks of pancreatic cancer compared with T2D alone. In the head-to-head comparison, PPDM was associated with a higher risk of pancreatic cancer compared with T2D followed by pancreatitis (HR 2.35; 95% CI 1.12–4.93). Pancreatitis significantly increases the risk of pancreatic cancer in individuals with diabetes. In particular, PPDM poses the highest risk for pancreatic cancer.



Figure—Probability of developing pancreatic cancer in the study groups. The analysis was adjusted for age, sex, ethnicity, social deprivation index, alcohol abuse, tobacco smoking, history of gallstones, cholecystectomy, and Charlson comorbidity index.

Source: Cho J et al. Diabetes Care 2020 Jul; dc200207. https://doi.org/10.2337/dc20-0207

The Association Between HbA1c and Time in Hypoglycemia During CGM and Self-Monitoring of Blood Glucose: GOLD-4 Study

According to recent guidelines, individuals with type 1 diabetes should spend <4.0% per day with glucose levels <3.9 mmol/L (<70 mg/dL) and <1.0% per day with glucose levels <3.0 mmol/L (<54 mg/dL).

In the GOLD randomized crossover trial, 161 individuals with type 1 diabetes treated with multiple daily insulin injections (MDI) were randomized to continuous glucose monitoring (CGM) or conventional therapy with self-monitoring of blood glucose (SMBG) and evaluated over 16 months. We estimated the association between time spent in hypoglycemia and various mean glucose and HbA1c levels.

Time spent in hypoglycemia (<3.9 mmol/L and <3.0 mmol/L) increased significantly with lower mean HbA1c and mean glucose levels during both CGM and conventional therapy. During CGM, 24 (57.1%) individuals with HbA1c <7.5% (<58 mmol/mol) had <1.0% time spent in hypoglycemia <3.0 mmol/L and 23 (54.8%) had <4.0% time spent in hypoglycemia <3.9 mmol/L. During CGM, mean time spent in hypoglycemia for individuals with mean HbA1c 7.0% (52 mmol/mol) was estimated to be 5.4% for <3.9 mmol/L and 1.5% for <3.0 mmol/L. The corresponding values during SMBG were 9.2% and 3.5%, respectively. Individuals with mean glucose levels of 8 mmol/L spent 4.9% units more time with glucose levels <3.9 mmol/L and 2.8% units more time <3.0 mmol/L during SMBG compared with CGM.

CGM is associated with considerably less time in hypoglycemia than SMBG at a broad range of HbA1c levels and is crucial for patients with MDI treatment

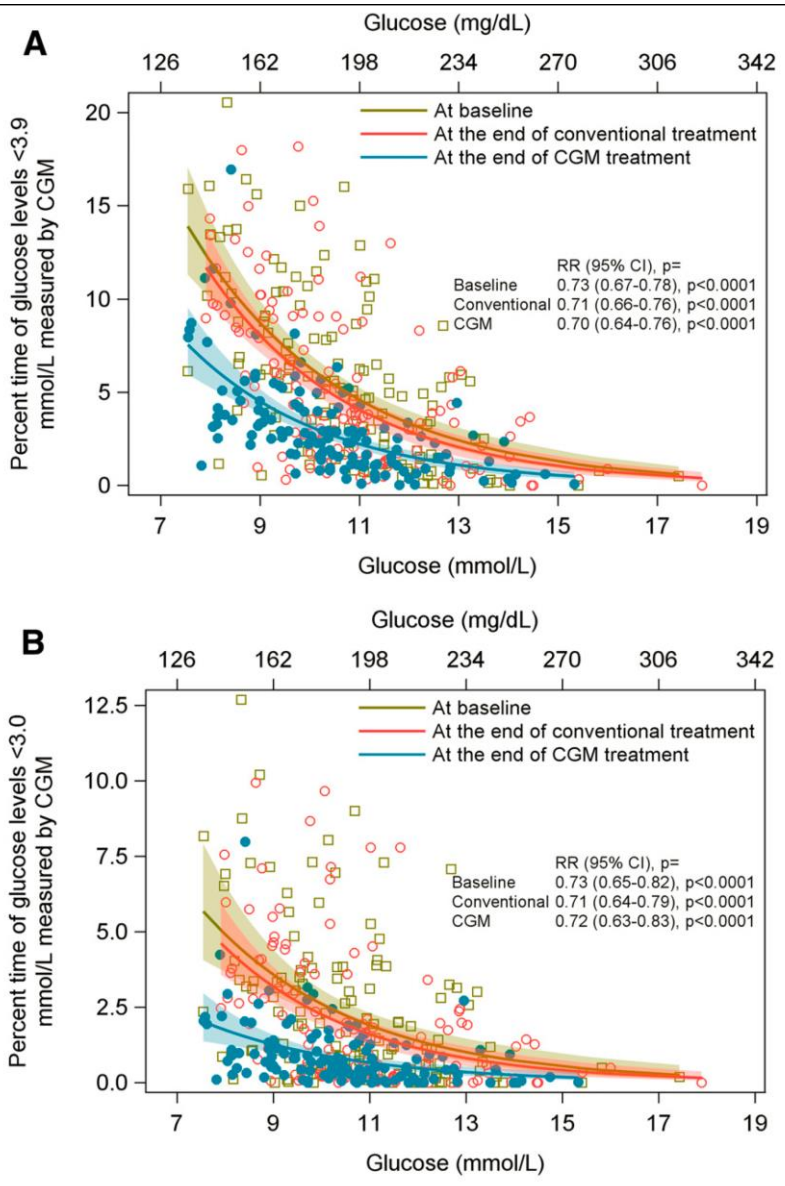


Figure 1—A: The association between mean glucose levels (mmol/L) and time in glucose level <3.9 mmol/L (<70 mg/dL) at baseline, at the end of conventional (SMBG) treatment and at the end of CGM treatment. B: The association between mean glucose levels (mmol/L) and time in glucose level <3.0 mmol/L (<54 mg/dL) at baseline, at the end of conventional (SMBG) treatment and at the end of CGM treatment.

Time spent in hypoglycemia for people with type 1 diabetes treated with MDI increases both during CGM and SMBG therapy with lower mean glucose and lower mean HbA1c levels. It is difficult for many patients with type 1 diabetes and MDI treatment to reach targets for

time spent in hypoglycemia even with somewhat higher HbA1c levels than the general target of 7.0% both with CGM and SMBG. CGM is, however, associated with considerably less time with hypoglycemia than SMBG both at HbA1c levels close to target and at high HbA1c levels. Overall, patients with type 1 diabetes treated with MDI need CGM treatment for glucose monitoring to have a chance to approach hypoglycemia targets and simultaneously reach HbA1c targets.

Source: Ahmadi SS et al. Diabetes Care 2020 Jul; dc192606. https://doi.org/10.2337/dc19-2606