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Editorial

Recent perspectives for clinical inertia for diabetes mellitus

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Diabetes mellitus (DM) has been a chronic disease with high social, medical, economic, and health burdens. Across the world, type 2 DM (T2DM) patients were observed at 425 million in 2017 and will be 629 million in 2045 [1]. The main concern would be a rapidly growing number, related complications and adequate treatment in response to various situations [2].

Clinical inertia or therapeutic inertia was defined as the failure to intensify or initiate adequate treatment in accordance with evidence-based guidelines. It is often a key cause for persisting hyperglycemia in T2DM patients [3,4]. Diabetic inertia occurs when healthcare professionals recognize the clinical situation for uncontrolled glucose variability, but do not conduct proper treatment [4,5]. The recent consensus of the American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD) has been presented, indicating to evaluate and to modify the treatment regularly at the 3-6-month interval, when HbA1c values remain above the target level [6].

International Diabetes Federation (IDF), ADA, and Japanese Clinical Practice Guidelines (JCPG) have presented the recommendation of HbA1c level as <7.0% for the majority of T2DM adults [7-9]. On the other hand, the American Association of Clinical Endocrinologists (AACE) has supported a slightly strict HbA1c level of <6.5% for most diabetic patients [10]. ADA and JCPG recommend rather stringent goals <6.5% and <6.0% for selected patients if achievable without the history of significant hypoglycemia or other adverse effects [7,8]. However, when the case has found severe hypoglycemia, advanced cardiovascular or extensive complications, the goal will be the less stringent level of <8.0% [8,11].

From the study of clinical inertia for 80,000 diabetic patients, intensification was delayed for 1.6-2.9 years for additional oral hypoglycemic agents (OHAs) [12]. The intensification ratio is as low as 37.1% for cases with HbA1c >7% [13]. Therapeutic delay of up to one year may increase the risk of cardiovascular events such as stroke, heart failure, and myocardial infarction [14]. The comparative result was observed about early vs delayed intensification. When a diabetic case has HbA1c >7% with metformin treatment alone, the intensification in <3 months vs 10-15 months will bring the difference that the former shows 1.36 times higher of achieving HbA1c target levels [15]. Further, between the case with vs without intensification, the ratio of achievement of <7% of HbA1c within one year is 35% vs 23%, respectively [16]. For highlighting this matter, ADA has recently initiated the campaign of “Overcoming Therapeutic Inertia” [17].

A study for diabetic patients showed that clinical inertia was found in 26.2% in the group (HbA1c>7%) and 18.1% in the group (HbA1c>8 %) associated with the development of non-intensification problems after 4.2 years follow up in median [4]. Further, widespread delay for starting insulin treatment is observed in South-Eastern and Central Europe [18]. For basal insulin-treated T2DM patients, intensifying ratio

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after recording HbA1c ≥7.0% would be 22.8% in 12 months and 27.5% in 17 months [19]. Actual clinical inertia in poor-controlled T2DM was studied [20]. Out of 13,824 cases provided ≥2 OHAs, 2,709 (19.6%) showed HbA1c ≥8% and BMI ≥30 kg/m^2, which were included in the study. Mean data were HbA1c 9.2%, BMI 32.1 kg/m^2, and diabetic history 8.2 years. Inertia was evaluated by the time (days) until the first intensification. As the results, the median time was 456 days, and the ratio of no intensification at 0.5, 1, 2, 3 years was 77.8%, 59.5%, 41.5%, 28.1%, respectively. Consequently, mean HbA1c remained ≥8% for > 1 year, and about 60% of cases were not received intensification in the follow-up at one year [20].

As to the investigation of clinical inertia in T2DM, Japan Diabetes Clinical Data Management (JDDM) Study Group has recently summarized the data [21]. It was a retrospective study with 33,320 Japanese T2DM patients with OHAs for 2009-2018. They used much data from the Computerized Diabetes Care (CoDiC®) database. The results showed that the median period until the intensification with OHA, GLP-1RA, insulin was 8.1, 9.1, 6.7 months, respectively. Simultaneously, the mean HbA1c value at starting intensification was 8.4%, 8.9%, and 9.3%, respectively. Regarding the patients with confirmed clinical inertia, their higher HbA1c level (≥7.0%) after six months was observed in one, two, or three OHAs as 42%, 51%, and 58%, respectively. It indicated that about half of patients are above the target level of HbA1c, regardless of taking some kinds of OHAs [21].

For the actual visiting practice in the primary care clinic, physicians and pharmacologists continued the research of clinical inertia for 18 months [22]. Eligible DM cases were 363 and baseline HbA1c was 9.6%. Treatment was intensified by PC physicians (n=684, 39.3%) and by pharmacist (n=721, 60.5%) with median [25%-75%] value as 105 [38-182] days and 49 [28-92] days, respectively. The latter pharmacists tended to intensify by GLP-1RA and SGLT-2i rather frequently. Consequently, pharmacist involvement may reduce clinical inertia for diabetic patients in the future [22].

physician-related	patient-related	practice-related
less knowledge of Guideline	denial of having the disease	no clinical guidelines
less familarity for new therapy	denial of serious situation	no disease registration
failure to set clear goals	low health literacy	inadequate technology support
complex managing for injection	less presense of symptoms	no visit planning
failure to initiate treatment	too many medications	no active outreach to patients
anxious about adverse effects	adverse effect of medicine	incomplete decision support
less manage to comorbidities	too complex medicine regimen	insufficient team approach
lower communication skill	lifestyle factors	poor communication
no feeling for patient's need	cognitive, emotional obstacles	inadequate education activity
less ability in decision making	depression or feeling problem	resistance to system changes

Figure 1. Various causes of clinical inertia.

Regarding the background of clinical inertia, three categories of aspects can be emerged, which are physician, patient, and practice-related (healthcare system, circumstance) conditions [23]. A variety of factors in three categories is shown in Figure 1. As mentioned above, clinical inertia for diabetes and related discussion was introduced. Various perspectives described here will hopefully contribute to the development of practice and research in the future.

Conflict of interest

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