Report of the International Conference on Diabetes and Obesity

International Conference on Diabetes and Obesity,
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The Endocrinology & metabolism Research Center (EMRC) of the Tehran University of Medical Sciences was established in 1993 at Doctor Shariati Hospital. The founding goals of the EMRC are to:

- Carry out basic, clinical and developmental research in the field of endocrinology and metabolism
- Disseminate information among fellow professionals and educate the public
- Establish a successful model for similarly motivated and aspiring institutions to follow

Since the establishment of the EMRC, diabetes research and education has been one of the major priorities of the center.

The EMRC organizes annual congresses in the field of endocrinology and this year's congress was the International Conference on Diabetes and Obesity, in collaboration with the International Diabetes Federation (IDF). The aim of this educational conference was to provide an update in the field of diabetes and obesity by several national, and international, experts. This conference was organized with the help of Abbas Kitabchi, MD, University of Tennessee (TN, USA).

Several distinguished speakers from the IDF & World Health Organization (WHO) including: Pierre Lefebvre (IDF President), Samed Shera (IDF Honorary President), Arab Morsi (Middle East IDF Regional president) and Oussama Khatib (Regional Advisor, non-Communicable Diseases EMRO, WHO) were invited to the meeting. There were also 36 other speakers who participated in the conference. The Conference took place at Imam Khomeini Hospital, which is one of the main hospitals of Tehran and has a beautiful and historic architecture.

Burden of diabetes in the world & Iran

For the opening lecture, Bagher Larijani gave a talk on the Burden of Diabetes and Obesity in the World and Iran. Approximately 194 million people worldwide, or 5.1%, in the age group of 20–79 years were estimated to have diabetes in 2003. This is expected to increase to some 333 million, or 6.3% of the adult population, by 2025. The largest proportional and absolute increase will occur in developing countries, where the prevalence will rise from 4.2 to 5.6%. Obesity is a problem around the world. Between 50 and 75% of adults aged between 35–64 years are overweight or obese.

Today, approximately 2 to 3 million (out of about 68 million) people suffer from diabetes and its complications in Iran. The prevalence of diabetes is increasing in Iran, like other developing countries. Prevalence of Type 2 diabetes mellitus (DM) in Tehran was 7.2% in 1995 and increased to 10.6% in 2001. The prevalence of impaired glucose tolerance (IGT) in Tehran was 8.4% in 1995 and increased to 12.4% in 2001. Approximately 50% of patients were not aware of their diabetes. Prevalence of obesity in different cities of Iran has been calculated: the overall prevalence of obesity in Iranian men and women (aged 25–65 years) has been reported to be 18.6% and 38.3%, respectively.

Activity of the EMRC on diabetes
The following provides an overview of EMRC projects to combat diabetes:
- National Project on Gestational Diabetes Mellitus
- Multicenter Survey in Iran – the prevalence of IGT and GDM
- Establishment of serum bank for diabetic patients
- Pancreas and β-cell transplantation
- Childhood Obesity intervention program
- Burden of Diabetes in Iran (2001).

EMRC publications in diabetes
Scientists from the EMRC have published and propagated more than 83 educational books, booklets and brochures on the following aspects of diabetes:

- Emergencies in diabetes mellitus
- Alphabets of diabetes mellitus
- Gestational diabetes mellitus
- Diabetes mellitus & exercise
- Approximately 50 educational booklets
- Producing educational posters, films and classes
- Educational articles in major newspapers

EMRC extends its educational services to the whole spectrum of the medical professionals, including medical students,

general practitioners, and specialists. In conclusion, diabetes is a common disease in Iran, and the incidence is progressively increasing. Many people are not aware of their problem. According to the increase in incidence, the authors expect more complications in the future. National diabetes control programs should stress education, prevention and control programs of diabetes.

Burden of diabetes in the world

Pierre Lefebvre continued the conference by discussing 'The Burden of Diabetes in the world: The world is facing an unprecedented diabetes epidemic'.

WHO technical report: prevalence of diabetes

According to the WHO Technical Report, the comparison of the prevalence of diabetes in the past, and at present, in different parts of the world are as follows (Table 1) [1]:

The number of people with diabetes is 177 million (154 million projected) and the top 10 countries are (number of people with diabetes) [2]:

- India
- China
- USA
- Indonesia
- Russia
- Japan
- United Arab Emirates (UAE)
- Pakistan
- Brazil
- Italy

The increasing prevalence of Type 1 diabetes is due both to an increase in incidence (a cause for concern) he said, and an increase in the longevity of the affected persons, (a cause of satisfaction). Regarding Type 2 diabetes, a marked increase in prevalence has been reported, including in children and adolescents. Approximately 95 million known cases of Type 2 diabetes exist and that is apart from the hidden, and unreported, cases and also from IGT cases. In this regard, the IDF will promote concerted action by governments and nongovernmental organizations for increasing awareness concerning the seriousness of Type 2 diabetes, promoting education at all levels and exercising multisectoral advocacy.

Diabetes in the East Mediterranean region

Oussama Khatib gave a report on 'WHO & Diabetes in the East Mediterranean Region (EMR)'. The global burden of noncommunicable diseases (NCDs) has increased during the past years and, although it was approximately 41% in 1990, it will reach 60% in 2020. In the EMR too there has been an epidemiologic transition from infectious diseases to noncommunicable diseases (cardiovascular disease, diabetes, respiratory, cancer and genetics) and the burden of NCDs was 57.1% in 2001 in this area. Diabetes is reaching pandemic in the region. Recent estimates have shown that its prevalence ranges between 7 and 25%. The highest was in the Gulf area (16–25%). Diabetes is the fourth leading cause of death in the authors' area. Many EM Countries are now reporting the onset of Type 2 DM at an increasingly young age. Subjects with Type 2 DM in the second and third decades of life and, in some Eastern Meditteranean countries, particularly the Gulf area, Type 2 DM is emerging in children.

One of the highlights of his speech was that, according to recent data, access to antidiabetic medications is not enough. Adherence to long-term therapies is usually 80 to 90% in developed countries, while in EM countries it is approximately 20 to 30%. In all, there is increasing evidence that it will become one of the foremost public health challenges to face our region in this new millennium.

Diabetes and obesity in Iran

Fereidoun Azizi gave his lecture on 'Diabetes & Obesity in Iran'. He said that, according to different studies, the diabetic population of Iran is assumed to be 2.5 to 3 million people and 14.5 to 22.5% of individuals aged over 30 years have IGT, of whom, nearly 25% will develop diabetes in the future. He also mentioned that recent studies have shown the high prevalence of over weight and obesity in the rural and urban population of Iran (Table 2). He concluded that the need for life-style modification in Iran, especially in the urban communities, is obvious.

Oxidative stress in diabetes

The second day began with the interesting presentation by Bagher Larijani on 'Oxidative Stress in Diabetes'. Increased oxidative stress in Type 2 diabetes may result from increased generation of reactive oxygen species or a diminished antioxidant defense, or both. Oxidative stress is believed to play an important role, albeit not fully recognized, in the development of vascular complication in diabetes, particularly Type 2.

The highlight of this presentation was the discussion that, in their study on the effects of allopurinol and carvedilol in the reduction of oxidative stress, allopurinol and carvedilol are not more effective than placebo in the reduction of oxidative stress in diabetic patients. Pentoxifylline, in comparison to placebo, was effective in reducing lipid peroxidation and levels

Table 1. Prevalence of diabetes in the past, and at present, in different parts of the world.				
Country	Year	Prevalence	Year	Prevalence
USA	1947	1.99%	1998	7.3%
UK	1960	0.96%	1995	2.4%
DDR	1962	3.55%	1995	2.4%
India	1963	2.64%	2001	6%

Table 2. Estimation of overweight and obesity in Iran.			
	Urban	**Rural**	**All**
Overweight	11.2*	5.2	16.4
Obesity	5.9	2.2	8.1
Total	17.1	7.4	24.5

* Million subjects (based on 66 million population and 65% ≥ 20 years of age).

of epidermal growth factor (EGF) and nitric oxide (NO) in plasma (p < 0.01). The authors concluded that adding pentoxifylline to the therapy of patients with Type 2 DM may be helpful in reducing oxidative stress indicators.

Diabetes Prevention Program

After, Abbas Kitabchi talked about the 'Diabetes Prevention Program: Strategies to Reduce Incidence of Type 2 Diabetes'. After explaining the importance of diabetes and its health impacts, he spoke on the feasibility of preventing Type 2 diabetes:

* There is a long period of glucose intolerance that precedes the development of diabetes

* Screening tests can identify people at high risk

* There are safe, potentially effective interventions that can address modifiable risk factors

He then mentioned the results of different studies on diabetes prevention, including:

* Da Qing IGT and Diabetes Study [3]: Enrolled 577 subjects with IGT (47% women, mean age 45 yr, mean body mass index [BMI] 26 kg/m^2). They had a 6-year follow-up and the cumulative incidence of DM was calculated. The intervention included a control and three active groups (**Box 1**).

Finnish Diabetes Prevention Study [4]: Enrolled 522 overweight subjects with IGT (172 men; 350 women; mean age: 55 years; mean BMI:

Box 1. Reduction in the incidence of diabetes mellitus.

* Diet only: 31%
* Exercise only: 46%
* Exercise plus diet: 42%

31 kg/m^2). The interventions included: control versus lifestyle (weight loss, diet and physical activity) intervention; seven sessions with a nutritionist/year; and supervised circuit-type resistance training sessions. The mean follow-up duration was 3.2 years. Annual oral glucose tolerance test (OGTT) was taken. The end point was newly diagnosed diabetes. IGT progressed to DM at a rate of 3%/year in the intervention group, and 6%/year in the control group. The cumulative incidence of diabetes: 1–2 yr: 6% intervention group, 14% control group, 2–4 yr: 11% intervention group, 23% control group. The cumulative incidence of diabetes was 58% lower in intervention group than control (63% men, 54% women) with a hazard ratio of 0.4 (0.3–0.7), p < 0.001.

Diabetes Prevention Program [5]: We enrolled 3234 subjects-IGT plus elevated fasting plasma glucose (1043 men, 2191 women, mean age 51 years, mean BMI 34 kg/m^2).
The intervention included:

* Intensive lifestyle intervention – 7% weight loss, 3 h/week exercise.

* Standard lifestyle recommendations plus metformin.

* Standard lifestyle recommendations plus placebo

They used a combination of lifestyle modification and drug therapy (Metformin + placebo) as their intervention. The eligible participants were randomized in to three groups, all of whom received standard lifestyle recommendations:

* Intensive lifestyle (n = 1079)

* Metformin (n = 1073)

* Placebo (n = 1082)

The highlight of his lecture was that the intensive lifestyle group had the least incidence of diabetes and the most change in tissue plasminogen activator and fibrinogen.

Diabetes in developing countries

The valuable lectures presented in the second morning were continued after break by Samad Shera's lecture on 'Barriers to Diabetes Care in Developing Countries'. Diabetes is a growing threat to the world's public health. It is no longer a disease of affluence.

Today there are approximately 200 million people with diabetes worldwide. This number is predicted to rise to almost 333 million by the year 2025. Of these diabetic patients, three-quarters will be from developing countries and more than a half from Asia. Education is the cheapest and most effective tool for the prevention of diabetes and its complications. Education based on the five 'P's is necessary to prevent diabetes and to improve diabetes care:

* P1: Policy – education of policy makers

* P2: Physicians – education of physicians and allied health professionals

* P3: People – education of people with diabetes

* P4: Public – education of public for dissemination of information

* P5: Press – education of the press and electronic media

For successful outcome, the sixth P, partnership, is required between the five other Ps. The barriers he mentioned included:

* Barriers affecting basic need and rights

* Medical barriers

* Educational barriers

- Emotional barriers

- Lack of political will & commitment to diabetes control programs

He then suggested some measures to combat these barriers:

- Increasing awareness of the problem of diabetes

- Reduction in costs by removing important duty and taxes

- Encourage the industry to manufacture in accordance with WHO

- Encourage research in basic, clinical amd social aspects of diabetes

- Encourage education through structured programs for people with diabetes

- Use the press and mass media to educate the public

Therapeutic agents in obesity

Pi Sunyer talked about 'Use of Therapeutic Agents in Obesity'. Therapeutic agents are mainly used for BMIs over 30. The initial goal of weight-loss therapy for the overweight patient is a reduction in body weight of about 10%, Moderate weight loss of this magnitude can significantly decrease the severity of obesity associated risk factors.

NIH Guidelines for Pharmacotherapy include [6]:

- Initiate when weight goals are difficult to achieve and/or maintain through diet and physical activity

- Select the appropriate drug based on patient assessment (BMI and other clinical and laboratory values)

- Administer in the long term

- Always use in conjunction with diet, physical activity, and behavior therapy

He then mentioned the US Food and Drug Administration (FDA)-approved drugs for weight loss: phentermine, sibutramine and orlistat and explained their advantage and disadvantages. In all, he noted that drug treatment for obesity has:

- Clinical benefits, it reduces comorbidity even with little weight loss

- Good results have been achieved in some patients; these medications are continued only in those with good results.

- Less expensive than treating multiple complications

He then concluded that:

- Obesity is a chronic disease, such as hypertension, diabetes and hyperlipidemia

- Modest weight losses (5–10%) provide significant health benefits

- Realistic expectations of success must be established – achieving an ideal weight is not realistic because of the physiology, even with surgical therapies

- More aggressive behavioral interventions will often produce better results when combined with medication

Professional education for diabetes management

After lunch, Arab Morsi spoke on 'The need for Professional Education Competences in Diabetes Management'. Patient education is the key for successful diabetes management. He remarked that, recently, analysis of the cases of failure in diabetes education programs in different communities revealed that an important factor is the lack of sufficient educational expertise among diabetes-caring personnel while playing the role of educators. He finally concluded that education courses will not succeed unless the diabetes health-caring personnel are exposed to training courses in education technology, in order to enable them to define proper objectives, implement efficient education methods and be able to select and perform valid and reliable methods for evaluation.

Vanadium & diabetes mellitus

On the last day of the conference, Ranjbar Omrani from Shiraz University of Medical Sciences talked about the 'Effects of Vanadium in Diabetes Mellitus'. In the past 10 years, research in the field of DM has mainly

focused on making orally active insulin-mimetic substances. Vanadium compounds are able to effectively control the diabetic state & prevent the development of diabetic complications in experimental animals. It acts as an insulin-mimetic agent in experimental-induced or genetic-inherited diabetic animals. In clinical trials, however, vanadium is administered precariously in limited low doses (2 mg/kg/day) and short period of 3–4 weeks. Although, the doses used in human studies were 20-fold lower than doses used in most animal studies, several beneficial effects were observed and documented.

Other talks of the conference covered topics ranging from pathophysiology, diagnosis and treatment of diabetes to insulin resistance and drug treatments for obesity. The excitement of each morning continued with daily sessions of 'meet the professor' at noon to provide the opportunity for face-to-face discussions.

A unique and valuable aspect of this conference was that nationally adjusted diabetes guidelines – gathered by EMRC & the national Iranian Diabetes Network – were distributed among the participants for the first time.

Conclusion

In conclusion, this international conference was a great experience for EMRC in collaborating with international organizations such as the IDF and the WHO and for exchanging up-to-date scientific facts with experts from all over the world.

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