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DIABETES PREVENTION AND CONTROL

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1. Introduction

Diabetes Mellitus, a global health problem of great magnitude, is now emerging in the Eastern Mediterranean Region (EMR) as a cause of major public health concern. Its manifestations cause considerable human suffering and enormous economic costs. In addition, diabetes causes serious complications: progressive damage to the eyes, kidneys, nerves and arteries represents the major threat to a person with diabetes. Retinopathy is the leading cause of visual disability; progressive impairment of kidney function, culminating in end-stage renal failure threatens the health and life of a substantial proportion of those who develop the disease in childhood or adolescence. Those who suffer from diabetes commonly exhibit neuropathic involvement of various patterns giving rise to a spectrum of clinical problems and disabilities. They also have a high risk of limb amputation and are particularly predisposed to coronary heart disease.

Besides genetic susceptibility, evidence indicates that physical inactivity, obesity, especially the central type, and certain dietary patterns, like increased intake of saturated fats and decreased intake of dietary fibre, can result in decreased insulin sensitivity and the development of diabetes.

Evidence also indicates that control of obesity, promotion of physical activity and healthy dietary patterns as well as good management of established cases can have a considerable effect in preventing diabetes and in reducing its complications.

In view of the above and because of the general lack of initiatives in many Member States that address the adverse social, economic and public health impact of diabetes, it is important to review the present situation in the EMR and to discuss prevention and control strategies that are relevant and appropriate to the Region. Based on this review and the discussion that will follow, the Regional Committee may consider adopting a resolution reflecting the need to strengthen efforts to prevent diabetes and to promote the availability of effective health care to those affected.

2. Demographic, socioeconomic and nutritional trends

Over the last two decades significant demographic changes have taken place. The total population in the EMR has almost doubled in 20 years, growing from 209 million in 1970 to 376 million in 1990. It is estimated that it will be 513 million by the year 2000 [1].

Children under the age of 15 constitute about 43% (range: 26-48%) of the total population of the EMR. The percentage of persons aged 65 years and over has been maintained at a low proportion, 3% in 1990. However, because of the favourable trend in infant and under five years mortality, life expectancy at birth has increased from 56 years in 1985 to 62 years in 1990.

Urbanization continues to increase. The proportion of the urban population has changed from 39% in 1985 to 44% in 1990. In some countries of the EMR, up to 100% of the population is urbanized.

There is a wide variation in demographic trends among countries. At one end of the spectrum are countries with a life expectancy as high as 76 years and at the other extreme are those with life expectancies as low as 42 years. A more striking pattern exists concerning socioeconomic indicators where extreme variations are seen. The per capita income ranges between US$170 in one country to US$15,770 in another (average of US$1130). The adult literacy rate ranges from 11% to 95% (average 43.5%).

Despite this heterogeneity, the demographic and socioeconomic indicators generally demonstrate a steady shift from traditional and rural lifestyles to more urbanized and modernized patterns.

This significant transition towards economic affluence in the EMR has been associated with changes in dietary patterns and nutritional status. Analysis of data collected from some countries of the Region on dietary consumption trends demonstrates a rapid rise in food energy availability and consumption beyond requirements. It has been predicted that if this increase continues at the present rate, the calorie availability in the Region as a whole will exceed that in developed countries in less than one decade [2, 3]. In Saudi Arabia for example per capita energy supplies have been shown to have increased in relation to nutritional requirements from 79% of daily requirements in 1970/1972 to 82% in 1973/1975, 108% in 1977/1979 and reached 123% in 1980/1982 [3]. A similar situation is noted regarding fats and carbohydrates where consumption of animal fats and sugar shows a steep upward trend. Surveys on food habits suggest that the average family is consuming more lamb, beef and chicken and less vegetables and fruit than before [3].

Information on adult obesity is available for only a few countries. Nevertheless, it is clear that it represents a significant problem in the Region. The rates of obesity reported from some member countries are remarkably high [2]. In one country, up to 53% of males and 63% of females are obese. A survey on the nutritional status of families in Oman reported that about 45.5% of mothers were obese [4]. A similar study from Bahrain reveals that 65% of mothers aged 18-48 years are obese [5]. Among Saudi Arabian adults aged 18 to 74 attending a primary health care centre, 51.5% of the men and 63% of females were considered obese. Overall marked obesity, defined as a body mass index (BMI)* of $\geq$30 kg/m^2 was seen in 25% of people [6]. Data on body weight patterns among school children are scarce but a study from Bahrain provides results of BMI levels similar to those reported for European children [7]. BMI was found to increase with rise in age (from 15 to 20 years) and the highest level was seen at age 20 in both boys and girls. Among obese women in Bahrain, age, education, employment,

* The BMI is a measure used to define obesity; it equals weight (kg) divided by height (m) squared.

marital status and family size were the factors positively associated with obesity [8]. A study on the socio-cultural and dietary factors predisposing to obesity among Egyptian adults >18 years confirms high rates of obesity and reveals a positive correlation with certain socioeconomic standards. Up to 50% of adults are obese in certain parts of Cairo. The prevalence of obesity is higher in females than among males and is positively related to socio-economic standards reaching more than 65% of females in areas of a higher socio-economic level [9].

3. Epidemiological considerations

Despite the wealth of epidemiological and clinical data published globally on diabetes there has been a general lack of accurate information on the magnitude of the problem in most EMR countries. Also, the varying methodologies and diagnostic criteria used in the epidemiological studies conducted create considerable discrepancies and make prevalence estimates difficult to compare. However, certain conclusions can be drawn from recent reports.

During the last decade, data on the epidemiology and clinical characteristics of the two types of diabetes, non-insulin dependent (NIDDM) and insulin dependent (IDDM) diabetes mellitus have been reported from Egypt, Iraq, Kuwait, Oman, Saudi Arabia, Sudan and Tunisia [10].

3.1 Non-insulin dependent diabetes mellitus (NIDDM)

One of the earlier NIDDM epidemiological studies in the region was that performed on rural and urban samples of the adult Tunisian population aged 20 years and over [11]. It was based on measurement of fasting blood glucose concentration (FBG), using the neocuproine reduction method, with the diagnosis made when this level exceeded 165 mg/dl (9.2 mmol/l). The cut-off point was reported by the authors to correspond to FBG of 140 mg/dl (7.8 mmol/l) measured by the glucose oxidase method. Age-standardized prevalence was found to be 4.6% in males and 3.5% in females in the urban sample, as compared with 2.3% and 0.6% in rural males and females respectively. Thus, there was a considerable difference in the prevalence rate between the rural and urban population groups studied - the figures indicate an urban prevalence rate twice that of the rural area. In 1985-86 a further study was carried out in an urban population sample in Tunisia. In this case, a 75 g oral glucose tolerance test (OGTT) and WHO diagnostic criteria were used. Prevalence in subjects aged 30 years and over was higher than in the former study - 9.2% in males and 9.1% in females.

A study performed in a small village population aged 15 years and over in southern Iraq, using a 50 g OGTT, revealed an overall prevalence of 4.8% [12]. In Saudi Arabia, a prevalence survey on diabetes in a rural population aged 15 years and above used random capillary blood glucose concentration as the initial measurement [13]. A value $\geq$200 mg/dl (11 mmol/l) was the cut-off point used. Those with an initial level ranging between 140 and 199 mg/dl (7.8 to less than 11 mmol/l) were subjected to a 75 g OGTT and were subsequently

classified according to current WHO criteria [14]. According to this survey, diabetes has a prevalence of 5.9% in females and 2.9% in males, with an overall prevalence of 4.3% among all ages and of 6.6% among subjects ≥15 years of age. The same investigators also reported an overall prevalence of diabetes of 5.0% in an urban sample [15].

A more recent report from Saudi Arabia describes a prevalence survey in semiurban-rural communities where a cluster of 12 villages (290 families) was studied and subjects aged 10 years and over were tested [16]. Here, the measurement used was the capillary blood glucose concentration 2 hours after the noon meal. Diabetes was diagnosed when this value was ≥200 mg/dl (11 mmol/l) and impaired glucose tolerance (IGT) when the level was ≥140 mg/dl (7.8 mmol/l) and <200 mg/dl (11 mmol/l). Using these criteria, the age-adjusted prevalence of diabetes was 4.6%. It was higher among men (5.5%) than among women (3.6%). IGT was diagnosed in 3.7%. Overall prevalence of IGT was 10.6% among those aged 30 and over (14% in males and 7.4% in females).

A recent national survey conducted in Oman, according to the full WHO recommendations on diagnosis, (i.e., including the results of the 2-hour blood glucose value after a 75 g oral glucose load on all subjects) revealed the highest prevalence estimates reported so far in the region. The survey, which covered a total national sample of 5127 subjects aged 20 years and over, showed that 9.7% of males were found to satisfy the diagnostic criteria for diabetes, with a further 8.1% diagnosed as having IGT. For females in the same age group, 9.8% and 12.9% were diagnosed as having diabetes and IGT respectively. The prevalence of diabetes and IGT in the total sample was respectively 9.8% and 10.9% giving an alarmingly high figure of 20.7% for total glucose intolerance [17]. There was some evidence of regional variation but generally most areas of the country reported prevalence of ≥10%.

A recent report from Egypt describes a prevalence status derived from several surveys based on WHO criteria performed in various geographic areas of the country [18]; they indicate an estimated total national prevalence rate of 4.3% for Egypt. Distinct geographic differences have been reported with prevalence of 5.7%, 4.1% and 1.5% in urban, rural agricultural and desert areas respectively.

In all surveys, prevalence of diabetes rose with advancing age. In Tunisia and Saudi Arabia, the prevalence progressively increased with age with the highest rate being observed over the age of 60 years. In Oman, prevalence rose from 1-2% in those aged 20-29 years to >30% in those aged ≥70 years.

In countries where no prevalence surveys have yet been conducted, other sources of information on diabetes also suggest a problem of major concern. A community-based study on the nutritional status of Bahraini mothers aged 18-48 years demonstrated a history of diabetes in 8.5% [19]. A more recent study on dietary habits of elderly people in the same country reports a prevalence of diabetes of 13.4% [20]. Needless to say, the true prevalence of diabetes is expected to be higher since a considerable proportion of cases is not recognized. Data

from several countries indicate that diabetes affects a high proportion of patients with cardiovascular diseases particularly myocardial infarction and stroke and those with end-stage renal disease.

High detection rates have been reported by some of the diabetes prevalence surveys mentioned above. In one of the Saudi Arabian studies, 86% of cases were known to have been diagnosed prior to the survey. The earlier Tunisian data indicate a prior detection rate of 60% in the urban population and 46% in the rural area. In the later Tunisian study, 51% of males and 57% of females were previously diagnosed.

The above data, though highly variable in their methodology, demonstrate the high susceptibility of some Eastern Mediterranean populations to NIDDM and confirm the importance of diabetes as a major public health problem in the region. However, further epidemiological studies will be required to elucidate the magnitude of the problem in different countries and to determine the effect of ethnic, geographic and socioeconomic factors. For comparability, as well as to maximize information, it is particularly important that future studies adopt the full criteria for diagnosis recommended by WHO, including the 2-hour blood glucose estimation after a 75 g glucose load for all adults.

3.2 Insulin dependent diabetes mellitus (IDDM)

Since the rate of occurrence of this form of diabetes varies widely in terms of geographical and ethnic distribution, it would be interesting to study the epidemiological pattern in the Eastern Mediterranean Region, where distinct ethnic groups live in various geographical conditions. Unfortunately, data on IDDM are generally scarce.

The first report (1983) on IDDM in this region came from Kuwait. The incidence of diabetes among Kuwaiti subjects 0-29 years of age during 1980-1981 was found to be 22.09 per 100 000 person-years. Eighty percent were in the age group 20-29 years and the majority were not on insulin therapy. There was a very low incidence in the 0-14 and 0-19 year age group (4.0 and 5.6 per 100 000 person-years respectively). All diabetic persons under 20 years of age were receiving insulin and none were overweight. The number of diabetic subjects increased with increasing age, but no remarkable age peaks were observed [21]. According to these findings, the incidence of IDDM in Kuwait is considerably lower than that reported from Europe and North America.

Higher incidence rates have since been reported elsewhere. A retrospective hospital-based study examined the incidence of IDDM for the years 1980-1982 in the eastern Province of Saudi Arabia. Incidence was 7 per 100 000 person-years [22]. The same study demonstrated an increase in incidence over a 3-year period. Another report on childhood diabetes in Saudi Arabia, also based on hospital records, suggested incidence peaks around 4-6 years and 11 14 years of age. The mean age of onset was 5.9 years [23].

To determine the epidemiology of IDDM in Sudan, the prevalence of this disease was assessed in 43 000 school children aged 7 to 14 years. The overall crude prevalence was 0.95 per 1000 [24]. Incidence, which was studied over a 4-year period between 1987-1990, using the hospital registry for diabetic children 0 to 14 years of age, was reported to be 5.9 per 100 000 person-years in 1987 and 10.1 per 100 000 person-years in 1990. The age distribution at onset was bimodal, with a clear peak at age 12 in girls and at age 14 in boys, and a smaller peak at age 7 in both sexes. The mean age at diagnosis was 9.9 years.

Thus, the available data suggest a difference in the incidence of IDDM within the Region. That IDDM is a relatively rare disease, as was initially suggested by the findings of the Kuwaiti report, has not been consistently confirmed elsewhere.

4. Clinical characteristics

4.1 Clinical presentation

The clinical aspects of diabetes have been reported from several countries. In a study involving 1175 patients seen in a diabetic clinic in Iraq, the majority of patients were in the age group 40 to 59 years. About 50% of patients presented with the classical symptoms of diabetes. Twenty-one per cent were asymptomatic at the time of diagnosis and diabetes was detected as a chance finding or because of unrelated symptoms. Insulin treated patients constituted just over 20% of cases while insulin dependency was documented in 16.5%. More than 50% of cases were on oral drugs and about one quarter of cases were treated by diet alone. The majority had a relatively short duration of diabetes (less than 10 years), a finding which may suggest a rising prevalence in recent years, or alternatively, a high mortality in established cases [25].

Malnutrition-related diabetes mellitus, a third type of diabetes reported in certain parts of Asia and Africa, does not appear to occur in this Region.

Reports on the coexistence of obesity and NIDDM indicate that it is present in 75%, 69% and 46% of patients in Iraq, Libyan Arab Jamahiriya and Sudan respectively [25-27].

A substantial proportion of subjects with IDDM present with ketoacidosis. This serious complication has been reported in 82%, 67%, and 30% of diabetic children at presentation in Sudan, Saudi Arabia and Iraq respectively [23-25]. This indicates a tendency for a severe clinical course, late diagnosis or both.

4.2 Long-term complications

Data from Iraq and Sudan indicate that in general, diabetic subjects in these countries develop long-term complications at rates similar to those reported in western countries. In Iraq, 29% were found to have clinical evidence of neuropathy. Retinopathy is detected in a

similar percentage (29%) with a progressive rise in prevalence as the duration of diabetes increases. Forty percent of all diabetic patients seen in the clinic have one or more of the late diabetic complications. This percentage rises to 86% in those with a duration of disease exceeding 20 years [25]. A study of the clinical features of 413 diabetic patients in Sudan (1993) revealed a similar trend as far as neuropathy is concerned; it was seen in 31.5% of cases. However, the prevalence of retinopathy was lower at 17% [28].

5. Existing health care services to people with diabetes

Despite the high prevalence of diabetes and its complications, essential health care requirements and facilities for self-care are often inadequate in many countries of the Region [29].

In some countries, an alarming situation exists concerning the health care status of people with diabetes, particularly those of the insulin-dependent type. The lack of access to even life-saving drugs like insulin, leading to mortality has been reported to be disturbingly high among children with diabetes. Data also suggest that maternal complications and perinatal complications in infants of diabetic mothers are remarkably high. Facilities and experience in the management of long-term complications like vision-threatening retinopathy and end-stage renal failure are not available in some places and grossly inadequate in others. Health care institutions are often overwhelmed by the increasing demands for diagnosis and treatment of the various disorders associated with diabetes.

A promising initiative is the recent establishment of the diabetes programme in the UNRWA's fields of operations. Health care is provided as part of a strategy to integrate diabetes health care into the existing primary health care system aiming to ensure good management and prevention of complications.

6. State of knowledge on diabetes among patients and their families

It is well known that living with diabetes requires knowledge and experience built up over time. Education of people with diabetes on self care, which is an essential part of management and the control of diabetes, cannot be ensured unless the requirements for education are met.

Patients' willingness to comply with treatment depends on their personal appreciation of the disease and its treatment. People will not be actively committed to their treatment unless they are convinced that the consequences of diabetes are serious, that it can be treated and that the benefits of treatment outweigh the psychological, social and financial costs [30]. These facts should be accepted in order to ensure the adherence of the person with diabetes to the different requirements of management and good control.

An assessment of health education status in the EMR reveals disturbing results regarding the availability of such services. The

data available indicate that a major proportion of people with diabetes are not receiving adequate information on even the basic aspects of self care. In many instances, patients may have no access to information on important issues related to life-saving measures like recognition and correction of hypoglycaemia and hyperglycaemia. With lack of education, compliance with dietary guidelines, oral hypoglycaemic therapy and insulin is generally poor and the proportion of well controlled cases is accordingly low.

To promote education of the community as well as of the diabetic population and to improve compliance to treatment is one of the great challenges of any diabetes control initiative.

7. Preventive strategies

7.1 Primary prevention: prevention of diabetes itself

7.1.1 Causes and mechanisms of NIDDM

Although the pathogenesis of the different forms of NIDDM are not fully understood, there are at least three important factors: (1) individual or ethnic genetic factors leading to susceptibility, (2) defects of pancreatic beta cell function, (3) decreased action of insulin (insulin resistance). It is also important to remember that NIDDM is a multifactorial disease; the two major determinants, interacting with each other in causing pancreatic dysfunction and insulin resistance are (1) genetic susceptibility, and (2) environmental factors.

Although the mode of inheritance is unknown in most instances, evidence for the genetic determinants of NIDDM is provided by twin studies and high concordance rates, familiar aggregation and prevalence studies for different ethnic groups living in the same environment.

Among the environmental factors involved, physical inactivity, obesity and fat distribution as well as certain nutritional trends emerge as the major causes of deterioration of glucose tolerance. Both obesity and physical inactivity increase insulin resistance.

Exercise has been shown to have a protective effect against NIDDM. Intervention studies have demonstrated the beneficial effect of physical activity in improving insulin sensitivity and glucose tolerance. Plasma insulin levels were found to decrease in obese insulin-resistant patients who participated in physical training programmes. Studies have also shown a substantially higher NIDDM prevalence among the least active versus the most active.

Available evidence implicates obesity as a risk factor for NIDDM. High BMI seems to be associated with increased risk of NIDDM in both sexes and in many ethnic groups. The distribution of fat appears to influence this risk. An increased association between central (truncal) obesity and glucose intolerance has been reported in many ethnic populations.

There is sufficient evidence to suggest that increased dietary intake of saturated fats and decreased intake of dietary fibre can result in decreased insulin sensitivity and abnormal glucose tolerance. Westernization of the diet appears to aggravate glucose tolerance and there is evidence to suggest that a return to a traditional diet is associated with a dramatic improvement in glucose tolerance.

7.1.2 Strategies for prevention of NIDDM

As demonstrated above, primary prevention of diabetes can be achieved by decreasing insulin resistance through correction of obesity and increased physical activity and by the promotion of healthy nutritional trends (reduction in the consumption of fat and refined carbohydrates and increase in fibre content of the diet). There are two possible approaches. The high-risk approach is directed to high-risk people, such as those with a strong family history of NIDDM, population groups in transition from traditional to westernized life-styles, obese individuals, hypertensive patients and those with previous abnormalities of glucose tolerance including previous gestational diabetes. The population approach is based on altering the environmental risk factors and determinants of NIDDM in the population as a whole through public education. The population approach is particularly appropriate in communities with a high susceptibility to diabetes.

Primary prevention of NIDDM may be integrated into intervention programmes for other noncommunicable diseases sharing common risk factors, such as cardiovascular diseases and cancer. Such an integrated approach is particularly recommended in countries experiencing epidemiological transition, in those with limited resources who receive the major part of care at the primary health care level, and in those where other noncommunicable diseases exist in similar proportions and where common intervention approaches are feasible.

7.1.3 Prevention of IDDM

IDDM is caused by an autoimmune process leading to progressive destruction of the pancreatic beta cells in genetically predisposed individuals. It is a gradual process which may occur over many years. Several factors have been implicated in initiating this immunological response and accordingly strategies for primary prevention and promising intervention studies are being considered. During the "prediabetic" stage individuals can often be recognized by the presence of immunological markers and by a decline of pancreatic function. Primary prevention of IDDM can thus be approached during this stage although the pathological process has already been initiated.

Although the prospects for prevention are considerably more hopeful than a decade ago, research must be intensified before primary prevention of IDDM becomes feasible and can reach all those who need it. In the meantime, prevention of complications is the most effective strategy available today for the control of this type of diabetes.

7.2 Secondary and tertiary prevention: prevention of complications

Secondary prevention of diabetes aims to identify early cases, through screening, to ensure early intervention with an aim to reverse the condition and prevent its progression. However, apart from gestational diabetes and selected high-risk groups, the costs and potential adverse effects of screening do not justify wide-scale screening programmes.

Tertiary prevention aims at preventing complications and disabilities caused by diabetes. Measures employed include early detection of complications, effective treatment and good glycaemic control.

Long term diabetic complications include microangiopathic complications (retinopathy and nephropathy), neuropathies and macroangiopathy (coronary heart disease, cerebrovascular disease and peripheral vascular disease). There is strong evidence to indicate that the development of complications is linked to hyperglycaemia and that poor control of diabetes accelerates their progression. Thus the major goal of diabetes management should be to maintain blood glucose levels close to the physiological limits. There have been several clinical trials comparing the effects of intensified and conventional diabetes treatment on the progression of complications. Intensified treatment, combined with frequent self monitoring of blood glucose results in better control of diabetes and slows or arrests the development of early manifestations of microangiopathic involvement. Additionally, recent data derived from the multicentre Diabetes Control and Complications Trial confirm the wider benefits of intensive treatment. Better control of diabetes is now known to be associated with a considerable reduction in the risk of development of retinopathy, nephropathy and neuropathy. The benefits include a delay in the onset and a major slowing of the progression of these complications. Based on this evidence, good glycaemic control should be recommended in the majority of individuals with diabetes with the aim of preventing complications. To meet this objective, **good management should be ensured and the standards needed for appropriate health care delivery to people with diabetes should be made available.**

Cardiovascular diseases occur with greater frequency and severity in the diabetic than in the non-diabetic population. It is the most common cause of death among people with diabetes. Cardiovascular risk factors occur more frequently in diabetes. In addition to smoking, these risk factors include hypertension, hyperlipidaemia, hyperinsulinaemia, microalbuminuria and obesity. Since reduction in coronary risk has been successfully achieved by intervention programmes in many populations in developed countries, it is imperative to focus on correction of cardiovascular risk factors in the diabetic population. Smoking cessation, avoidance of obesity, control of blood pressure and intensified treatment of diabetes, dietary modification and promotion of physical exercise are the main measures to be taken.

Guidelines for the prevention and control of various complications have been prepared by the Regional Advisory Panel on Diabetes and were endorsed during the First Regional meeting on diabetes.

8. WHO initiatives

Recognizing the growing problem of diabetes, especially as it pertains to developing countries, the Forty-second World Health Assembly adopted, in May 1989, **a resolution (WHA42.36) on the prevention and control of diabetes.** This resolution invited Member States to assess the national importance of diabetes, to implement population-based measures for its prevention and control and to share opportunities for training and further education. The resolution also requested the Director-General of WHO to provide support for these activities and to foster relations with its collaborating centres and with nongovernmental organizations. Guidelines for the development of national programmes for diabetes mellitus were prepared to assist health planners and diabetes professionals to develop diabetes policies and programmes adaptable to local situations.

Various Regional initiatives have followed. In 1989, as a joint activity of the WHO Regional Office for Europe and the International Diabetes Federation, representatives of government health departments and patients' organizations from all European countries met with diabetes experts in San Vicenzo, Italy, to discuss diabetes care and research. A set of recommendations on strategies to improve the quality of diabetes care and to achieve marked reduction in the incidence and severity of diabetes complications emerged from the meeting.

Responding to the increasing awareness of the magnitude of the problem in Member States, the Regional Office for the Eastern Mediterranean established a task force to review the current situation of diabetes in the Region and to develop an outline for a prevention and control plan. The meeting was convened in the Regional Office in Alexandria, Egypt, on 14 and 15 November 1991, and was attended by experts from the Region and a representative of the International Diabetes Federation. The meeting endorsed a plan for diabetes control in the Eastern Mediterranean Region and made certain recommendations for future action. The plan is based on promoting the formulation of national programmes, supporting epidemiological research, and strengthening national human resources, in both programme management and clinical management capabilities. To guide organizational activities and to monitor progress of the regional plan, certain short- and medium-term targets were proposed. To reach these targets, WHO will continue to collaborate closely with the International Diabetes Federation and other regional professional associations and groups, and will enhance cooperation among Member States in order to enlarge the scope of joint activities in the prevention and control of diabetes and its complications.

The Task Force Meeting was followed by the establishment of the Regional Advisory Panel on Diabetes Prevention and Control and by the

First Regional Meeting on Diabetes which was organized for national coordinators of diabetes programmes in December 1992.

A regional plan for diabetes prevention and control was prepared in 1991 and reviewed by the Regional Advisory Panel in 1992. Regional guidelines for the establishment of national programmes for diabetes prevention and control were developed. They cover pre-requisites for the development of programmes and setting goals and targets and also include important issues related to planning, implementation and evaluation.

Minimum standards for health care for people with diabetes in the Region have been established. Such standards represent essential requirements for health in communities with limited resources but can be modified to aim for the optimal care of the person with diabetes as local circumstances allow. Guidelines on screening for gestational diabetes mellitus and for the prevention of long-term complications relevant to the EMR have also been formulated. These include guidelines for diabetes associated blindness as well as those necessary for the prevention of cardiovascular complications, promotion of foot care and prevention of amputation.

A protocol for a diabetes prevalence survey has been developed for use in EMR countries.

National efforts to conduct epidemiological studies on diabetes have been supported in several countries.

Recognizing the pressing need for action to promote diabetes education in the EMR and to strengthen national initiatives in this respect, a Regional Consultation was organized in November 1993. This consultation developed the approaches necessary for upgrading the education of people with diabetes and of their families.

A Regional document entitled "Diabetes Prevention and Control: A Call for Action" has been published and circulated to countries within the Region.

Within the WHO collaborative programme for 1994-1995 collaborative activities related to diabetes control have been planned in 14 countries.

Collaboration with member countries in assessing the magnitude of the problem will continue in 1996-1997 and support to national efforts in developing and implementing national plans will be given particular emphasis.

WHO will also continue to disseminate information and technical guidelines and to support epidemiological and health system research related to diabetes.

Details of the Regional plan and the resulting technical guidelines are included in the document "Diabetes Prevention and Control: a Call for Action".

9. Conclusions

Current evidence concerning the public health significance of diabetes in the EMR indicates a problem of major concern and growing magnitude and confirms the high susceptibility of EMR populations to NIDDM. Diabetes and its complications are already major causes of morbidity, disability and premature death in many countries of the Region.

The situation is compounded by the general inadequacy of essential health care facilities and the serious lack of initiatives for organized programmes.

Given this situation and the changing demographic, nutritional and disease patterns of the Region, it seems clear that the burden of diabetes and the predictably enormous costs of the disease cannot be ignored [31].

In the strategy for the control of diabetes in the EMR, the following major issues must be considered:

- Primary prevention has the potential to reduce the burden of diabetes through promotion of healthy lifestyles which should also have a positive effect on the control of other major problems such as cardiovascular diseases and cancer.

- Good management of established cases provides the possibility of reducing the potentially large costs and the devastating complications and disabilities caused by diabetes.

- Case management is extremely important and should be based on promoting the availability of minimum standards of health care to people with diabetes and on strengthening national initiatives on patient education and behaviour modification.

10. Recommendations

10.1 Member Countries are urged to initiate national diabetes programmes aiming at prevention of diabetes and its complications and reducing their enormous social and economic costs. Ministries of Health should be asked to allocate appropriate resources for these programmes and appoint a focal person responsible for the coordination of national activities.

10.2 Member States should be urged to provide the essential elements of health care to people with diabetes at various levels of health care. Emphasis should be placed on free availability of essential diagnostic and therapeutic agents at an affordable cost. Mechanisms should be sought to achieve this in a cost-effective, yet quality-controlled manner.

10.3 As a preliminary phase of the programme, Member States should promote collection of data on the magnitude and impact of diabetes. Such data which should include criteria to monitor complications and measures to determine economic costs will be used as a baseline for monitoring future progress of the programme.

10.4 Diabetes prevention and control activities should be integrated, where appropriate, into efforts aimed at the primary prevention of other noncommunicable problems, particularly cardiovascular diseases.

10.5 At least one national centre or institution specialized in diabetes should be established and supported in each country. Such a centre should not only provide treatment for complications but is also essential for research and training. Existing centres of excellence in diabetes care should be strengthened.

10.6 Interested nongovernmental organizations and national diabetes associations should be invited to support national programmes and take an active part in their implementation. In countries where no such organizations exist, the establishment of national diabetes associations should be encouraged, whenever possible.

10.7 WHO should continue to provide member countries with technical advice and support in programme formulation, implementation and evaluation.

10.8 WHO should promote the development of educational material appropriate to EMR populations and should assist countries in strengthening national resources and capabilities in diabetes education activities.

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REGIONAL COMMITTEE FOR THE
EASTERN MEDITERRANEAN

EM/RC41/10
October 1994

Forty-first Session

Agenda item 12

DIABETES PREVENTION AND CONTROL

Summary of Recommendations

It is recommended that Member States:

1. Initiate national diabetes control programmes aiming at prevention of diabetes and its complications and reducing their enormous social and economic costs. Ministries of health should allocate appropriate resources for these programmes and appoint focal persons responsible for the coordination of national activities.

2. Provide the essential elements of health care to people with diabetes at various levels of health care. Emphasis should be placed on easy availability of essential diagnostic and therapeutic agents at an affordable cost. Mechanisms should be sought to achieve this in a cost-effective, yet quality-controlled manner.

3. Promote collection of data on the magnitude and impact of diabetes. Such data, which should include monitoring of complications and determining economic costs, will be used as a baseline for monitoring future progress of programmes.

4. Integrate, where appropriate, diabetes prevention activities into efforts aimed at the primary prevention of other noncommunicable problems, particularly cardiovascular diseases.

5. Establish in each country, and support, at least one national centre or institution specialized in diabetes. Such centres will not only provide treatment for complications, but will also undertake research and training. The existing centres of excellence in diabetes care should be strengthened.

6. Invite interested nongovernmental organizations and national diabetes associations to support national programmes and take an active part in their implementation. In countries where such organizations do not exist, the establishment of national diabetes associations should be encouraged, whenever possible.

WHO is requested to:

1. Continue to provide Member States with technical advice and support in programme formulation, implementation and evaluation, and

2. Promote the development of educational material appropriate to populations of the Region and assist countries in strengthening national capabilities in diabetes control activities.

REGIONAL COMMITTEE FOR THE
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EM/RC41/10
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Forty-first Session

Original: English

Agenda item 12

DIABETES PREVENTION AND CONTROL

Summary for the Report

The item was presented by Dr A. Alwan, Regional Adviser, Non-communicable Diseases.

Diabetes mellitus, a global health problem of considerable magnitude, is now emerging in the Eastern Mediterranean Region as a cause of major public health concern. Factors that contribute to the increasing prevalence of diabetes include improved survival and a higher life expectancy, urbanization, changes in nutritional trends and dietary patterns associated with modernization, increasing prevalence of obesity and a tendency towards physical inactivity.

During the last decade, data on the epidemiology and clinical characteristics of the two types of diabetes--non-insulin-dependent diabetes mellitus (NIDDM) and insulin-dependent diabetes mellitus (IDDM)--are available from Egypt, Iraq, Kuwait, Oman, Saudi Arabia, Sudan and Tunisia. The studies indicate that diabetes affects up to 10% of the population of the age 20 years and above, and this figure reaches 20% if impaired glucose tolerance (IGT)--a lesser degree of glucose intolerance--is also included. These figures are considerably higher than the prevalence reported in many developed countries and demonstrate the high susceptibility of populations in the Region to diabetes.

Both acute and long-term diabetic complications are commonly encountered. A substantial proportion of children with IDDM present with ketoacidosis for both IDDM and NIDDM, and long-term complications, such as cardiovascular diseases, end-stage renal failure, retinopathy and neuropathic involvement, are already major causes of morbidity, disability and premature death in the Region.

Despite the high prevalence of diabetes and its complications, essential health care requirements and facilities for self-care are often inadequate in many countries, while, in some, an alarming situation exists as to the health care status of people with diabetes, particularly those of the insulin-dependent type. People may have no access to even life-saving drugs, for example insulin. Facilities and experience in the management of long-term complications, such as vision-threatening retinopathy and end-stage renal failure, are not available in some places and grossly inadequate in others.

Given this situation and the changing demographic, nutritional and disease patterns in the Region, it seems clear that the burden of diabetes and the predictably enormous cost of the disease cannot be ignored. Primary prevention of diabetes can be achieved by correction of obesity and increased physical activity and by promotion of healthy nutritional trends. For established cases, the objective is to prevent or reduce complications and disabilities caused by diabetes (secondary and tertiary prevention) by good management and by ensuring the availability of essential requirements for appropriate health care delivery to people with diabetes.