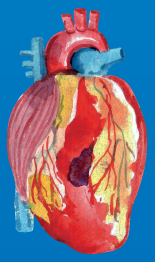
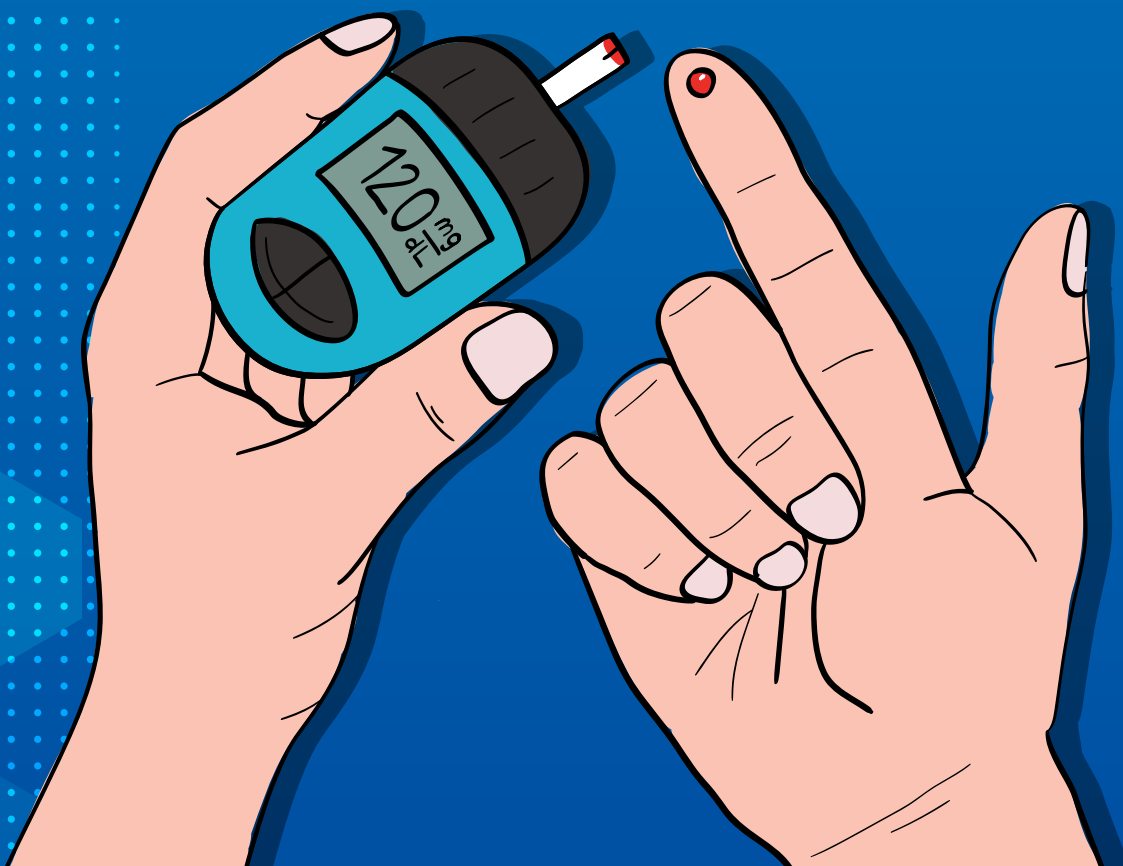
Bureau of Police Research and Development

Ministry of Home Affairs, New Delhi

PROCEEDINGS OF THE WEBINAR ON DIABETES





PROCEEDINGS OF THE WEBINAR ON DIABETES

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MESSAGE

Increasing prevalence of Diabetes in Police Forces is a matter of grave concern, as it not only adversely affects their overall health, but also affects their performance. Frequent exposure to highly stressful and challenging work-environment further leaves them with very little or no time for self-care and family. Thus, it is important to understand various dietary and lifestyle risk factors, among others, so that appropriate measures could be adopted for prevention and control of Diabetes in Police Forces.

With a view to increasing awareness about Prevention, Management, and Control of Diabetes in the Police Forces of the country, the Modernization Division of the BPR&D conducted a webinar on **"Diabetes: Prevention, Management, and control"** at the BPR&D Headquarters, New Delhi on February 19, 2021 . Three eminent Diabetologists of the country delivered talks on important aspects of Diabetes and shared their experiences. They also clarified many of the issues raised by the participants.

I congratulate Dr. Karuna Sagar, IPS, IG/Director, Modernization Division, and his team of dedicated officials, comprising Dr. Ajit Mukherjee, PSO (LS), and Shri John Thomas, SSO (LS), on successful conduct of this important webinar.

I believe, the proceedings of the workshop will be very useful for our Police Forces and will go a long way in preventing and controlling Diabetes and ensuring their overall health and well-being.

22/6/21

(V.S.K. Kaumudi)

डॉ. करूणा सागर, भा.पु.से.
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EXECUTIVE SUMMARY

Diabetes is one of the major lifestyle diseases affecting our population and Police Forces alike across the country. To increase awareness about Diabetes among Police Forces of the country, the Modernization Division of BPR&D organized a Webinar on "Diabetes: Prevention, Management, and Control" on February 19, 2021 from 4 PM-6.30 PM at the BPR&D Headquarters, New Delhi.

Three eminent speakers of the country namely Prof. Nikhil Tandon, Padma Shri, AIIMS, New Delhi, Prof. V. Mohan, Padma Shri, Dr. Mohan's Diabetes Specialties Centre, Chennai and Prof. S V Madhu, UCMS, New Delhi delivered talks on various important aspects of Diabetes and clarified many issues raised by the participants. One hundred and twelve Police Officials from CAPFs, States/UTs and outlying units of BPR&D participated in the webinar from across the country.

Shri Santosh Mehra, ADG in his inaugural address welcomed all the eminent speakers and participants and expressed his happiness that Modernization Division of BPR&D is conducting a webinar on a topic of great importance. He also expressed his concern on the rising prevalence of Diabetes in the country and especially its increasing prevalence among the Police Forces.

Speaking first, Prof. Nikhil Tandon explained "Diabetes" and described its current status in the country. Diabetes is a silent disease. It could be an asymptomatic disease and so one has to be conscious and get regular check-ups done. He also talked about various risk factors of Diabetes and emphasized that risky behaviour leads to risk factor, risk factors lead to disease. So, risky behaviour will become risk factors tomorrow and risk factors today could result in diseases tomorrow. Following his talk, Prof. Tandon clarified many of the issues raised by the participants.

Prof. V Mohan, the second speaker talked in the context of COVID and Diabetes and noted that the morbidity and mortality due to COVID was much higher in the diabetics with uncontrolled blood

sugar levels. In addition to many approaches, he mentioned about **"Free Style Libre Pro Flash Glucose Monitoring System"** which is a non-invasive new technology now available providing retrospective data of blood glucose level up to 2 weeks. By this method the blood glucose can be monitored 24x7 for a period of two weeks. He also gave tips for improving immunity and healthy living. At the end of his talk, Prof. Mohan clarified many important points raised by the audience.

Prof. S V Madhu, the third and last speaker of the webinar talked at length on the prevention and control strategies of Diabetes. He felt that Type 2 Diabetes can be prevented by life style changes. We need to focus on prevention and develop cost effective strategies for prevention of Type 2 Diabetes. Life style interventions work better than drugs. He put lot of emphasis on "Healthy Living" i.e., adopting a life style that promotes physical and mental fitness and facilitates prevention of life style diseases. He elaborated the role of "Stress" in Diabetes and explained **Stress** can both contribute to and be a consequence of **Diabetes**. Unless we address stress, we will not be able to prevent the life style diseases completely. He also discussed various stress-reduction measures. Prof. Madhu also answered and clarified many of the issues raised by the participants.

Overall, it was an excellent webinar covering all the important aspects on Prevention, Management, and Control of Diabetes. Hope, the proceedings of the webinar in its current form will cater to the health-needs of our Police Forces and help in preventing development of Diabetes in them.

(Dr. Karuna Sagar, IPS)
IG/Director, Modernization

Minute To Minute Programme

WEBINAR

Diabetes – Prevention, Management and Control
Modernization Division, BPR&D Hqrs, NH-8, Mahipalpur, New Delhi

Date: 19th February, 2021
Venue: BPR&D Hqrs., New Delhi
Time: 4 pm – 6.00 pm

Time	Topic	Speaker/Moderator
4 pm	Inaugural address	**Shri Santosh Mehra,** ADG, BPR&D
4.10 pm	Current status of Diabetes in the country and evaluation of risk factors with particular reference to lifestyle	**Prof. Nikhil Tandon,** Padma Shri Prof. & Head, Endocrinology, AIIMS, New Delhi
4.40 pm	Q/A session	Moderated by **Shri Karuna Sagar**, Dir/IG (Mod), BPR&D
4.45 pm	Healthy living at the time of COVID with reference to Obesity and Diabetes	**Prof. V. Mohan,** Padma Shri Dr. Mohan's Diabetes Specialities Centre, Chennai
5.15 pm	Q/A Session	Moderated by **Shri Karuna Sagar,** Dir/IG (Mod), BPR&D
5.20 pm	Prevention and Control strategies for Diabetes with particular reference to role of stress at work-place	**Prof. S V Madhu** Director Professor & Head, Endocrinology UCMS, New Delhi
5.50 pm	Q/A Session	Moderated by **Shri Karuna Sagar,** Dir/IG (Mod), BPR&D
5.55 pm	Vote of Thanks	**Shri B Shanker Jaiswal,** DIG, BPR&D
6.00 pm	High Tea	Lounge Second Floor, BPR&D

Proceedings of the Webinar on "Diabetes: Prevention, Management, and Control"

February 19, 2021, BPRD Headquarters, New Delhi

To increase awareness about Diabetes among the Police Forces of the country, a Webinar on "Diabetes: Prevention, Management, and Control" was organized by the Modernization Division of BPR&D, New Delhi on February 19, 2021.

Shri Santosh Mehra, ADG, Shri Karuna Sagar, IG/Dir (Mod) and Mrs. Anupama Nilekar Chandra, IG (R&CA) and Shri B Shanker Jaiswal, DIG were among the distinguished participants in the Webinar from BPR&D. Senior Officers of all the divisions of BPR&D and staff attended the Webinar from their seats through a web-link. A total of 112 Police Officials from CAPFs, States/ UTs, and outlying units of BPR&D joined the webinar from across the country.

The eminent experts who delivered talks on various important aspects of Diabetes included Dr. Nikhil Tandon, Padma Shri, Prof & Head, Endocrinology, Metabolism and Diabetes, AIIMS, New Delhi; Dr. V.Mohan, Padma Shri, Dr. Mohan's Diabetes Specialties Centre, Chennai, and Dr. S.V Madhu, Director-Professor & Head, Endocrinology, UCMS, New Delhi.

Shri Santosh Mehra in his inaugural address welcomed all the eminent speakers and participants and expressed his happiness that the Modernization Division of BPR&D is conducting a webinar on a topic of great importance. He also expressed his concern on the rising prevalence of Diabetes in the country and especially its increasing prevalence among police forces. India is being referred to as the Diabetes capital. Studies have shown that that the prevalence of diabetes in urban India is 9% and in rural India, it is 3%. Some studies have also shown that in police forces the prevalence of Diabetes is as high as 11 to 15%. Obesity, unhealthy diets, and widespread physical inactivity are some of the contributing factors for the continued rise of diabetes in the country besides, the police forces are exposed to the high-risk stressful environment which might worsen their health condition. Lifestyle factors like the sedentary nature of the job, long working hours, unable to keep social commitments, inadequate sleep, and irregular dietary habits contribute to health disorders particularly diabetes. Chronic patients with diabetes are more prone to diseases of the heart, kidneys, and the eyes, and also their feet get impacted. The eminent and experienced speakers will enlighten and guide the police forces to handle diabetes and prevent its complications by adopting a healthy lifestyle.

Current status of Diabetes & Evaluation of Risk Factors

Prof. Nikhil Tandon, the first speaker of the Webinar, spoke about the Current status of Diabetes in the country and the evaluation of risk factors with particular reference to lifestyle. Explaining the basics of diabetes, he mentioned that "Diabetes" is a Greek word meaning siphon i.e., pumping out a lot of water. The most obvious sign of severe diabetes is excessive urination. The word "Mellitus" is a Latin word meaning sweet like honey. So, in other words, patients with diabetes tend to pass out a lot of urine with glucose in the urine. Diabetes is characterized by elevated blood glucose. The elevation of blood glucose in the body could be due to two reasons. Firstly, the pancreas which is an endocrine gland and is located just below the stomach, produces a hormone called insulin which is responsible for glucose to be taken up by the tissues providing energy, does not produce enough insulin (type 1 diabetes). Secondly, the body cannot effectively utilize the insulin it produces (type 2 diabetes). A high proportion of type 2 diabetes is undiagnosed. The symptoms of diabetes are an increase in urination, an increase in thirst, and weight loss despite an increase in appetite, fatigue, recurrent infection, and poor healing of wounds. All these symptoms occur when blood sugar levels are very high. There can be a condition where diabetes shows no symptoms at all. Such asymptomatic conditions can only be detected by getting a blood medical check-up done and one may find the blood glucose measurements consistent with the diagnosis of diabetes. The values of blood glucose consistent with the diagnosis of diabetes are:

Fasting plasma glucose level (FPG) ≥ 126mg/dl,

Random Plasma glucose level (RPG) ≥200 mg/dl,

Oral glucose tolerance level (OGTT) ≥200 mg/dl,

and

HemoglobinA1c (HbA1c) which is an average blood glucose level over three months ≥ 6.5%.

The goals for a diabetic should be to have the daily measurement of FPG between 70 to 130 mg/dl, postprandial glucose (PPG) below 180 mg/dl and, HbA1c (long term) less than 7%. The systolic blood pressure should be < 130 mmHg and Diastolic blood pressure should be < 80 mmHg.

The country-wide survey on Diabetes "ICMR-INDIAB" has shown a prevalence of diabetes as 12.9 % in urban areas and about 7.4 % in rural areas. The overall prevalence of diabetes was estimated to be was 9.4 %. The prevalence of diabetes in UP, Bihar, and Jharkhand is about 4% as per this study, whereas it is about 23.6% in Puducherry, Goa, and Kerala. One out of three people in their early 50s may have diabetes in urban India. The distribution of FPG and DM for 20 years in Delhi-NCR shows the overall prevalence of diabetes increased from 12.7 to 20.2 in urban areas and from 3.0 to 9.6% in rural areas. There is a concept about the incidence of diabetes. This is relevant for supposing you do not

have diabetes today or take 100 people who do not have diabetes today, what are the chances of them developing diabetes over some time. As per a study conducted with a little over 1000 non-diabetics, after 10 years, 30 of them developed pre-diabetes and over 20 of them developed diabetes. This is one of the highest incident rates throughout the world. Similarly, if we compare our data with US whites it indicates that even for people who are not obese the incidence of diabetes is three times higher in Asian men compared to US men and five times higher in our women compared to white women. So we not only have a higher prevalence but also seem to be acquiring more numbers which suggest our prevalence will rise quite rapidly over some time. The lifetime risk of diabetes in urban India is another way of evaluating the lifetime risk of acquiring diabetes. According to a study, if you are a 20-year-old man or woman living in metropolitan India today, there is a lifetime risk of 55% if you are a man and 65% if you are a woman for developing diabetes. This percentage is very high and the highest reported in any part of the country. If you are underweight the lifetime risk is about 40 to 50% depending upon whether you are a man or a woman. If you are overweight but not obese the risk rises to 70% and if you are obese you have an 85% chance of developing diabetes.

There are three important things to be considered - Risk behavior, risk factor, and the disease. Risk behavior includes an Unhealthy diet, Tobacco use, Physical inactivity, Alcohol, Environmental pollution, etc. Risk factors are raised blood pressure, raised blood sugar, raised blood lipids, obesity and overweight. Non-communicable diseases that can develop include Coronary Heart Diseases, Diabetes, Stroke, Cancers, and Chronic Respiratory Diseases. Your risky behavior today leads to risk factors tomorrow and your risk factor today leads to the disease tomorrow.

Type 1 diabetes is an autoimmune disease - the cause of which is not known. For type 2 diabetes, the risk factors include age, family history, overweight/obesity, race/ethnicity (south Asians develop diabetes at lower BMI), and previous history of gestational diabetes. Having two or more of the above risk factors drastically increases the risk of diabetes. Abdominal obesity even the absence of overall obesity predisposes one to develop diabetes. To prevent diabetes we need to eat healthily, need to stay healthy, need to stay active, need to go for regular medical check-ups. Regular medical check-ups are very important because if we wait to develop symptoms, the blood sugar level might have by then reached elevated levels and your body may already be at risk. One should know one's risk factors and also identify modifiable risk factors. Must try to maintain one's weight and should avoid tobacco at any cost. One must limit the consumption of alcohol as much as possible.

Understanding the broad principles of diet for patients with diabetes is important. One should have less quantity of food, should eat less refined foods, more complex carbohydrates, less saturated fats, large amounts of fruits and vegetables if possible five servings of fruits and vegetables. Potatoes and underground growing vegetables are called tubers and those should be avoided. Eat fewer mangoes, bananas, strawberries, Chikoo as they contain more carbohydrate. Fruits like Jamun, Kiwi, Citrus fruits, Gooseberry, etc. can be consumed in moderate amounts. In terms of vegetables, cauliflower, carrot, green leafy vegetables like Palak, Bathua, Methi Sarson can be taken as part of your meal along with dal. Eat less, peas, pumpkin potatoes, and tubers. There are various methods to decide how much to eat. The Hand Method is very crude but sometimes it is practicable. You can look at your hand and decide. For carbohydrates- equal to the size of two fists (includes grains and starches), fruits- equals the size of one fist. Proteins- equal the size of your palm. Vegetables- as much you can hold in your both hands & Fats-equals to the size of the tip of your thumb. This gives us a rough estimate as to how much

we should be having and a sense that carbs, but complex carbohydrates, proteins maybe 20% of your food intake. Of the fats, saturated fats, ghee, coconut, all have to be avoided. Another way of estimating how much of what kind of food one has to take is by using the Plate Method. In this method, 50% of the plate consists of Non-starchy fruits and vegetables (carrot, cabbage, cauliflower, broccoli, spinach, and tomato), 25% grains, and starchy food (grains, rice, potato, corn, yam, green peas, and pasta), 25% proteins (fish, eggs, cheese, beans, and lentils). Yet another way of eating is by using the Healthy Eating Pyramid. At level 1, at the base of the pyramid is what you can eat at the largest quantity which is vegetable and fruits, the next (level 2) will be grain that too whole grains, at level 3 of the pyramid is proteins- dairy, non-dairy vegetable proteins, and non-veg proteins if you are a non-vegetarian. The next is fats and nuts at level 4 and at level 5 are the calorie-dense foods like sweets which one should limit not only in quantity but also in the frequency of consumption daily.

Physical activity is very important and it could be work-related or leisure-related. We should consciously try to make an effort and see what work-related activities we can do. One can climb three flights of stairs and avoid the elevator. One can get down one stop before one's destination and walk the rest of the distance to maintain physical activity. However, if one doesn't have an opportunity for work-related activities, then leisure-related activities like swimming, jogging, playing badminton, skipping, walking, cycling and other brisk physical activity should be done for half an hour to 45 minutes daily.

Dr. Nikhil Tandon emphasized that Diabetes is a silent disease. It could be an asymptomatic disease and so one has to be conscious and get regular check-ups done. There has been a rapid increase in the prevalence of Diabetes in the last 25 years. There is a lot of heterogeneity marked between urban and rural areas, and what is worrying is that there is a significant rise in diabetes in rural areas. What is happening in Metro cities today may happen in smaller cities tomorrow and what is happening in smaller cities and towns may happen in villages the day after tomorrow because the villagers are also acquiring some of the bad urban habits. Incident rates of Diabetes are very high even in people with normal BMI. Incidence rates are three to five times higher in Indians compared to whites. The lifetime risk of Diabetes mellitus in 20-year-old men and women is 55.5 and 64.6% respectively.

Dr. Nikhil Tandon finally concluded by saying, risky behavior leads to a risk factor and risk factors lead to disease. So, risky behavior will become risk factors tomorrow and risk factors today will result in diseases tomorrow.

In the Q/A session, Shri Shanker Jaiswal wanted to know whether type 2 diabetes could be reversed. Dr. Tandon explained that the blood glucose value can be reverted to a normal range, by losing weight, making changes in dietary habits, and taking up physical activity. However, the moment you stop taking the above precautions, there will be an elevation in blood sugar levels. A sustained effort is required to keep the blood sugar levels in normal condition. Moreover, delaying the rise in blood sugar levels rather than preventing it indefinitely, is a battle that is important to have won. One should have routine medical check-ups and adopt a healthy lifestyle in preventing diabetes. If you are in the pre-diabetic stage, with the help of regular physical activity, weight loss, and diet changes, you can prevent or at least delay the progression of diabetes. Responding to another question from Shri Jaiswal, Dr. Tandon said that dependence on anti-diabetic drugs could be got rid of by bringing in major lifestyle changes when the patient is in an early stage of diabetes. Ms. Tapasya Nair, AIG/Welfare CISF HQ, N.Delhi wanted to know how much physical activity a child ideally requires. Dr. Tandon opined that children should be playing at least for an hour a day.

Current Status of Diabetes in India & Evaluation of Risk Factors

Dr Nikhil Tandon
Department of Endocrinology and Metabolism
All India Institute of Medical Sciences, New Delhi

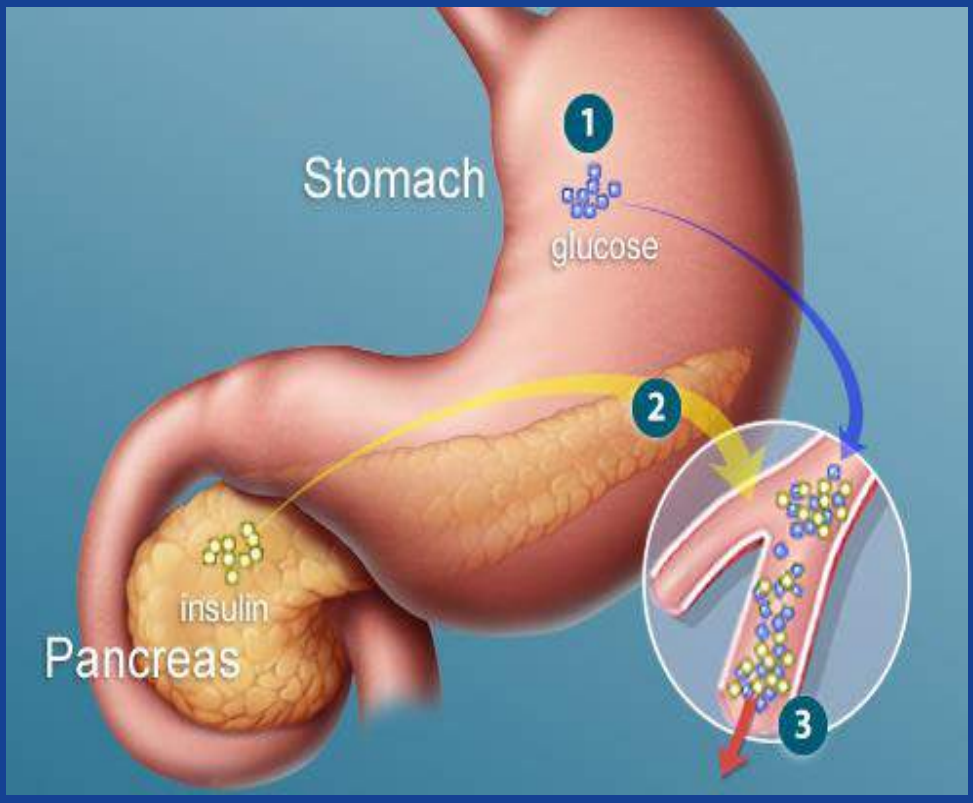
Presentation Plan

- Understanding Diabetes
- India prevalence
  - Multi-centre studies
  - Trends over time
  - Difference from other ethnicities
- Incidence Data
- Life-time risk
- Risk factors and prevention
- Conclusions

Understanding Diabetes

- Diabetes comes from a Greek word that means to siphon.
- The most obvious sign of diabetes is excessive urination.
- ***Mellitus*** comes from a Latin word that means sweet, like honey.

Diabetes



- is a serious, chronic disease
- characterized by elevated blood glucose
- occurs either when the pancreas does not produce enough insulin (type 1)
- or the body cannot effectively use the insulin it produces (type 2)

Understanding Diabetes

SYMPTOMS

- Increased urination
- Increased thirst
- Weight loss despite increased appetite
- Fatigue
- Recurrent infections
- Poor wound healing

Diagnosing diabetes

- **Measuring glucose in blood**
  - Fasting
  - 2 hours after a 75g oral load of glucose
- **Measuring glycated haemoglobin (HbA1c)**

High proportion of type 2 DM is undiagnosed

Diabetic blood levels

- Fasting Plasma Glucose (FPG) ≥126 mg/dl
- Random Plasma Glucose(RPG) ≥200 mg/dl
- OGTT ≥200 mg/dl
- HbA1c ≥6.5%

Goals for a person with diabetes:

Daily numbers

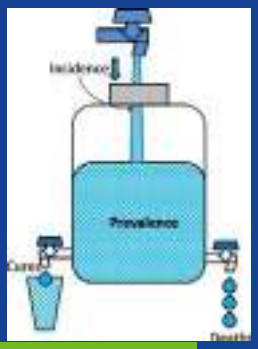
- FPG: between 70-130 mg/dl
- Post Prandial Glucose (PPG) : below 180 mg/dl

Long term numbers

- Hb A1C : Less than 7%

Blood pressure

- Systolic bp <130 mmHg
- Diastolic bp <80 mmHg



Prevalence of Diabetes in India

ICMR – INDIA DIABETES [ICMR-INDIAB] STUDY

All 28 states + 2 union territories + National Capital Territory of Delhi

4000 representative samples from each State/UT

(1,200 Urban & 2,800 Rural)

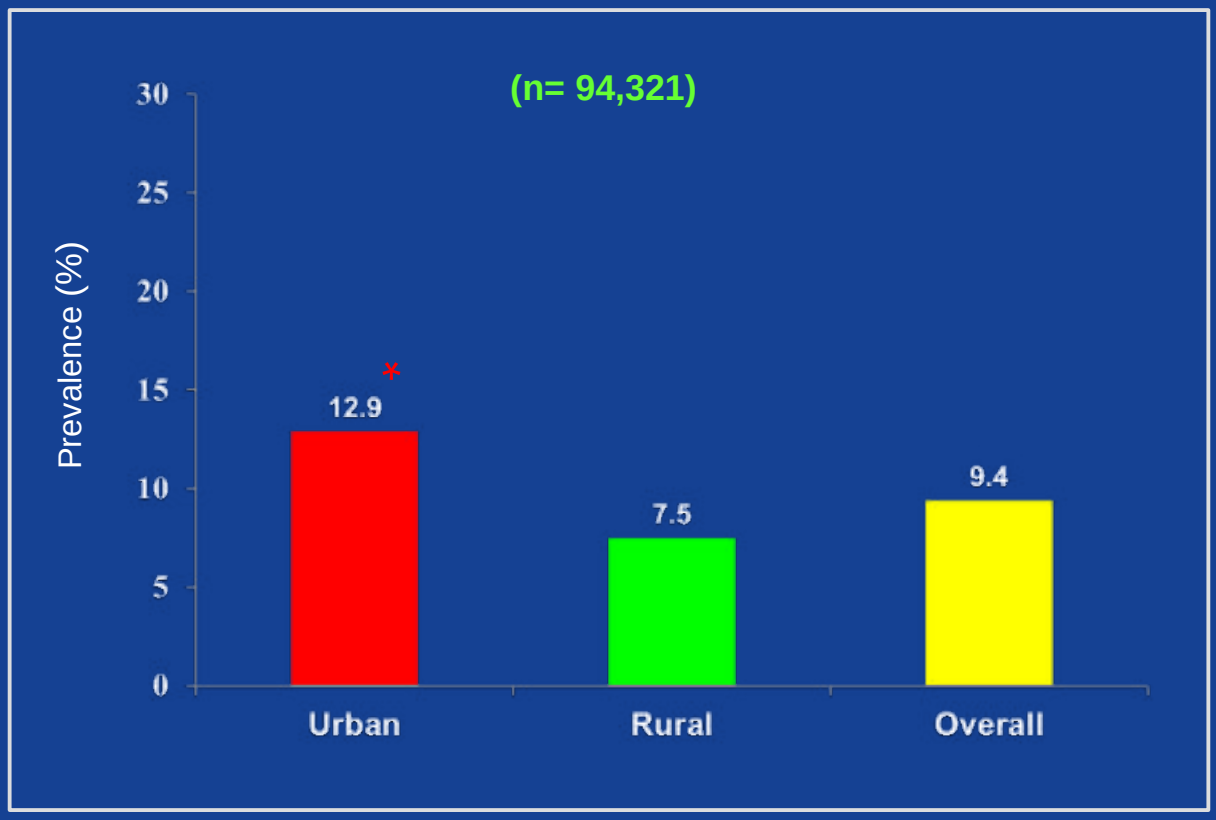
TOTAL SAMPLE SIZE 1,24,000

Currently surveyed = 99,596

Largest epidemiological study on diabetes in India

Anjana RM, et al for the ICMR – INDIAB Study group, Journal of DST 2011 ; 5: 906 - 914

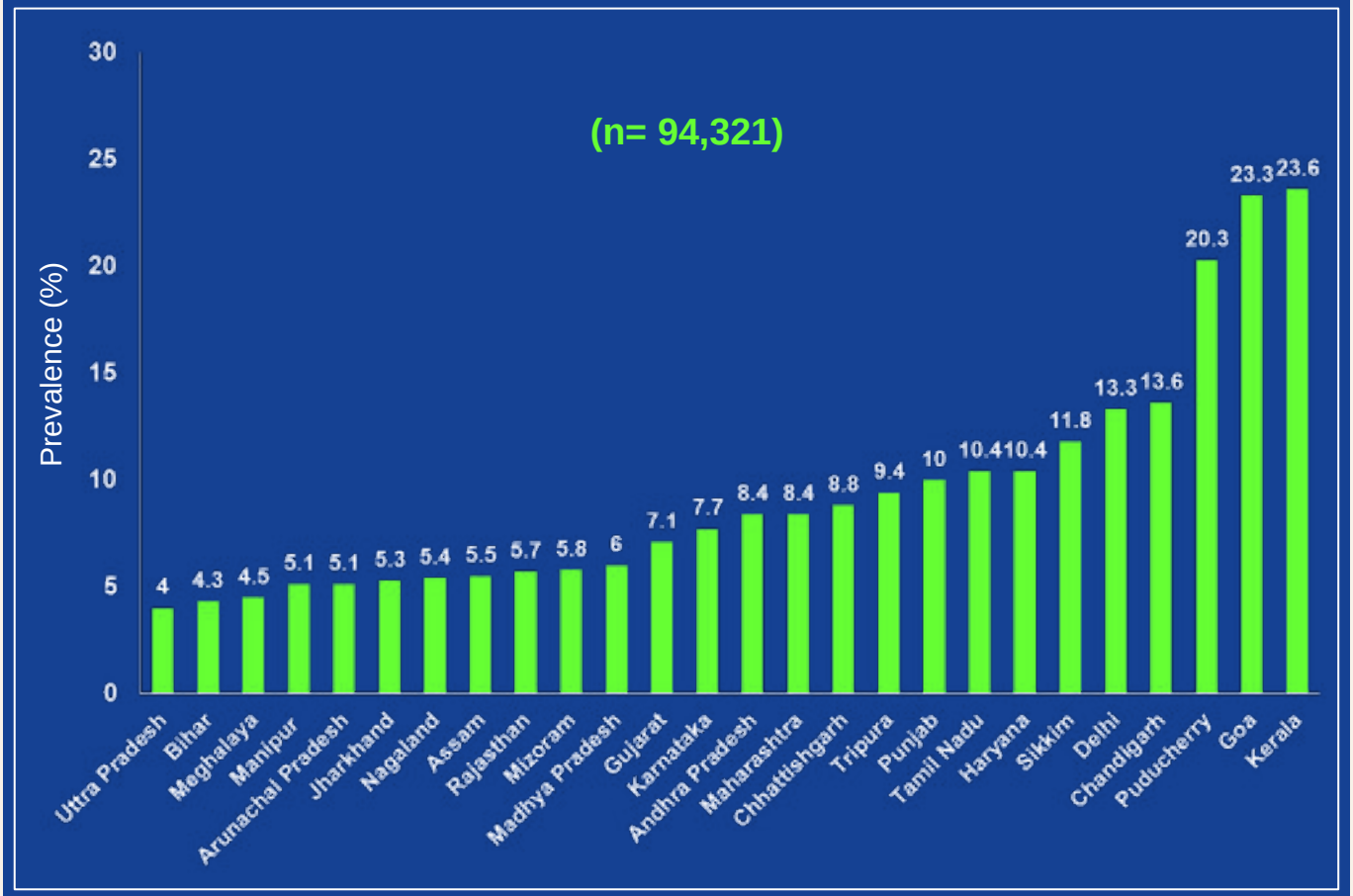
WEIGHTED PREVALENCE OF DIABETES IN THE ICMR- INDIAB STUDY POPULATION (26 STATES/UT)



* p<0.001 compared to rural counterparts

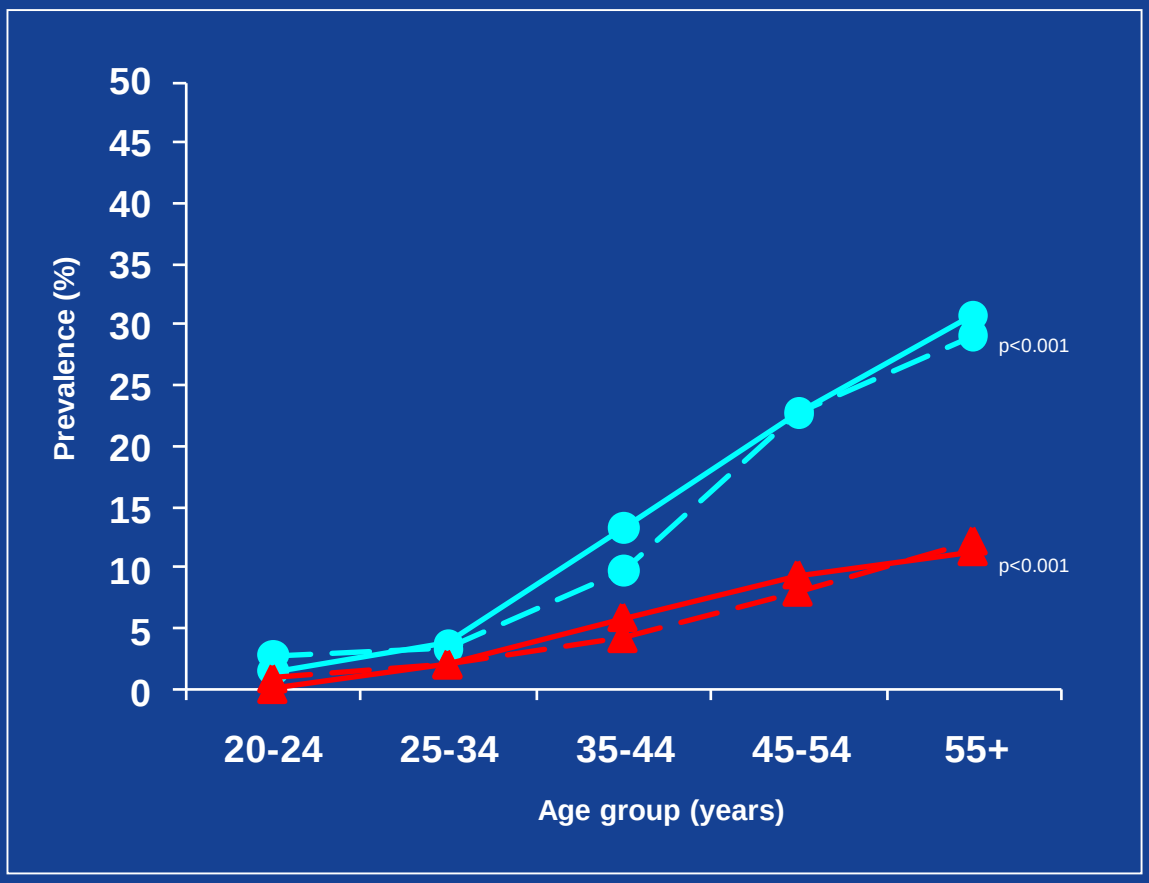
ICMR – INDIAB Collaborative Study Group

WEIGHTED PREVALENCE OF DIABETES IN THE ICMR- INDIAB STUDY POPULATION (26 STATES/UT)

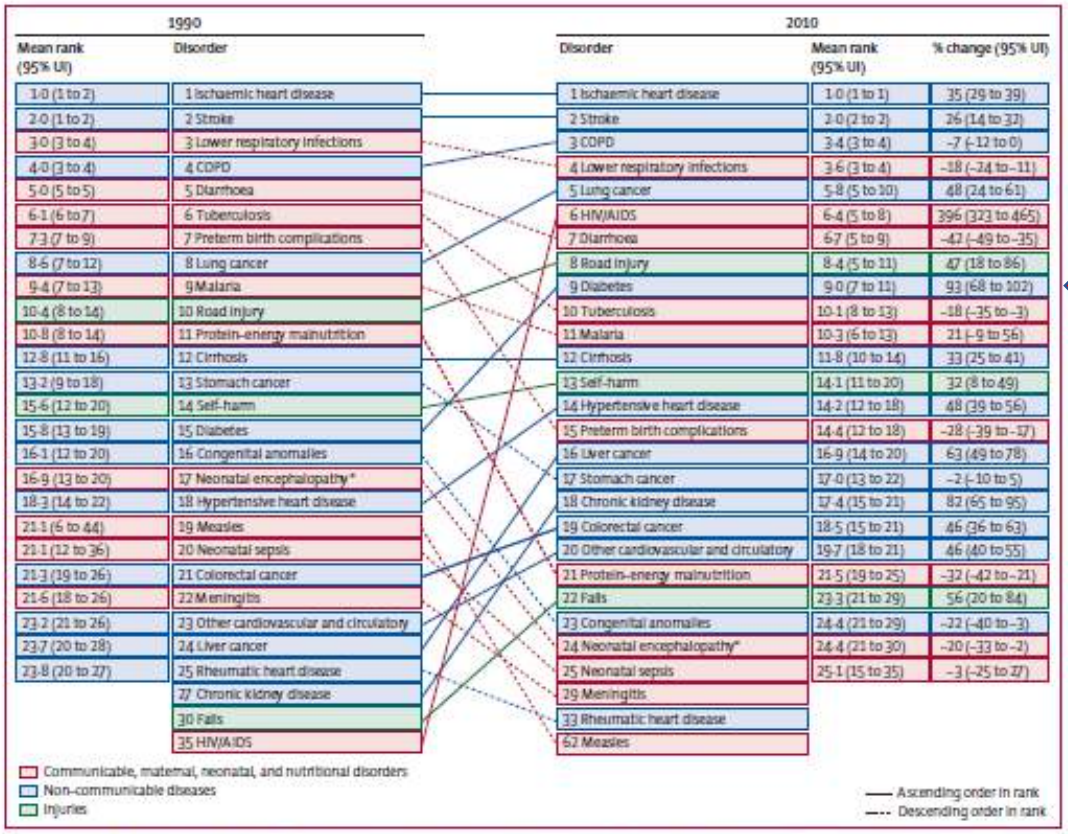


ICMR – INDIAB Collaborative Study Group

Age and gender specific weighted prevalence of diabetes



Diabetes Prevalence- Trends over time



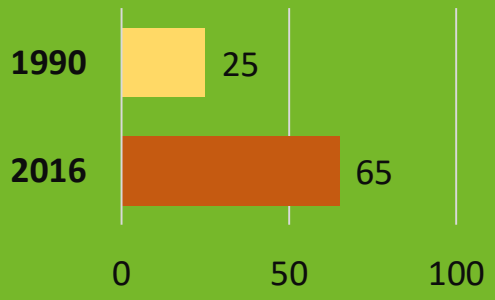
1990 Mean rank (95% UI)	1990 Disorder	2010 Disorder	2010 Mean rank (95% UI)	2010 % change (95% UI)
1·0 (1 to 2)	1 Ischaemic heart disease	1 Ischaemic heart disease	1·0 (1 to 1)	35 (29 to 39)
2·0 (1 to 2)	2 Stroke	2 Stroke	2·0 (2 to 2)	26 (14 to 32)
3·0 (3 to 4)	3 Lower respiratory infections	3 COPD	3·4 (3 to 4)	−7 (−12 to 0)
4·0 (3 to 4)	4 COPD	4 Lower respiratory infections	3·6 (3 to 4)	−18 (−24 to −11)
5·0 (5 to 5)	5 Diarrhoea	5 Lung cancer	5·8 (5 to 10)	48 (24 to 61)
6·1 (6 to 7)	6 Tuberculosis	6 HIV/AIDS	6·4 (5 to 8)	396 (323 to 465)
7·3 (7 to 9)	7 Preterm birth complications	7 Diarrhoea	6·7 (5 to 9)	−42 (−49 to −35)
8·6 (7 to 12)	8 Lung cancer	8 Road injury	8·4 (5 to 11)	47 (18 to 86)
9·4 (7 to 13)	9 Malaria	9 Diabetes	9·0 (7 to 11)	93 (68 to 102)
10·4 (8 to 14)	10 Road injury	10 Tuberculosis	10·1 (8 to 13)	−18 (−35 to −3)
10·8 (8 to 14)	11 Protein-energy malnutrition	11 Malaria	10·3 (6 to 13)	21 (−9 to 56)
12·8 (11 to 16)	12 Cirrhosis	12 Cirrhosis	11·8 (10 to 14)	33 (25 to 41)
13·2 (9 to 18)	13 Stomach cancer	13 Self-harm	14·1 (11 to 20)	32 (8 to 49)
15·6 (12 to 20)	14 Self-harm	14 Hypertensive heart disease	14·2 (12 to 18)	48 (39 to 56)
15·8 (13 to 19)	15 Diabetes	15 Preterm birth complications	14·4 (12 to 18)	−28 (−39 to −17)
16·1 (12 to 20)	16 Congenital anomalies	16 Liver cancer	16·9 (14 to 20)	63 (49 to 78)
16·9 (13 to 20)	17 Neonatal encephalopathy*	17 Stomach cancer	17·0 (13 to 22)	−2 (−10 to 5)
18·3 (14 to 22)	18 Hypertensive heart disease	18 Chronic kidney disease	17·4 (15 to 21)	82 (65 to 95)
21·1 (6 to 44)	19 Measles	19 Colorectal cancer	18·5 (15 to 21)	46 (36 to 63)
21·1 (12 to 36)	20 Neonatal sepsis	20 Other cardiovascular and circulatory	19·7 (18 to 21)	46 (40 to 55)
21·3 (19 to 26)	21 Colorectal cancer	21 Protein-energy malnutrition	21·5 (19 to 25)	−32 (−42 to −21)
21·6 (18 to 26)	22 Meningitis	22 Falls	23·3 (21 to 29)	56 (20 to 84)
23·2 (21 to 26)	23 Other cardiovascular and circulatory	23 Congenital anomalies	24·4 (21 to 29)	−22 (−40 to −3)
23·7 (20 to 28)	24 Liver cancer	24 Neonatal encephalopathy*	24·4 (21 to 30)	−20 (−33 to −2)
23·8 (20 to 27)	25 Rheumatic heart disease	25 Neonatal sepsis	25·1 (15 to 35)	−3 (−25 to 27)
	27 Chronic kidney disease	29 Meningitis		
	30 Falls	33 Rheumatic heart disease		
	35 HIV/AIDS	62 Measles		

Communicable, maternal, neonatal, and nutritional disorders
Non-communicable diseases
Injuries

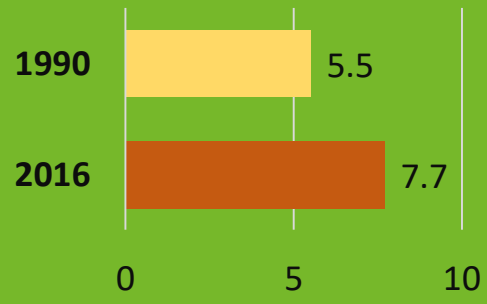
Ascending order in rank
Descending order in rank

Figure 4: Global death ranks with 95% UIs for the top 25 causes in 1990 and 2010, and the percentage change with 95% UIs between 1990 and 2010
UI=uncertainty interval. COPD=chronic obstructive pulmonary disease. *Includes birth asphyxia/trauma. An interactive version of this figure is available online at http://healthmetricsandevaluation.org/gbd/visualizations/regional.

Diabetes prevalent cases (millions) in India 1990 to 2016

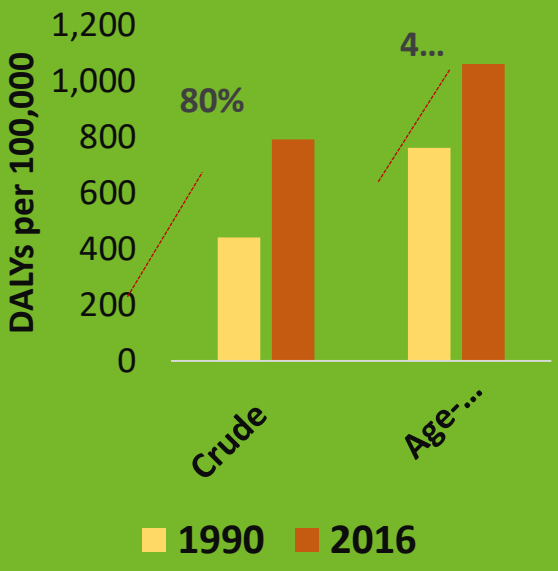


Diabetes prevalence (per 100) in India 1990 to 2016



Diabetes prevalent cases have more than doubled from 1990 to 2016

Change in DALY rate for diabetes in India 1990 and 2016

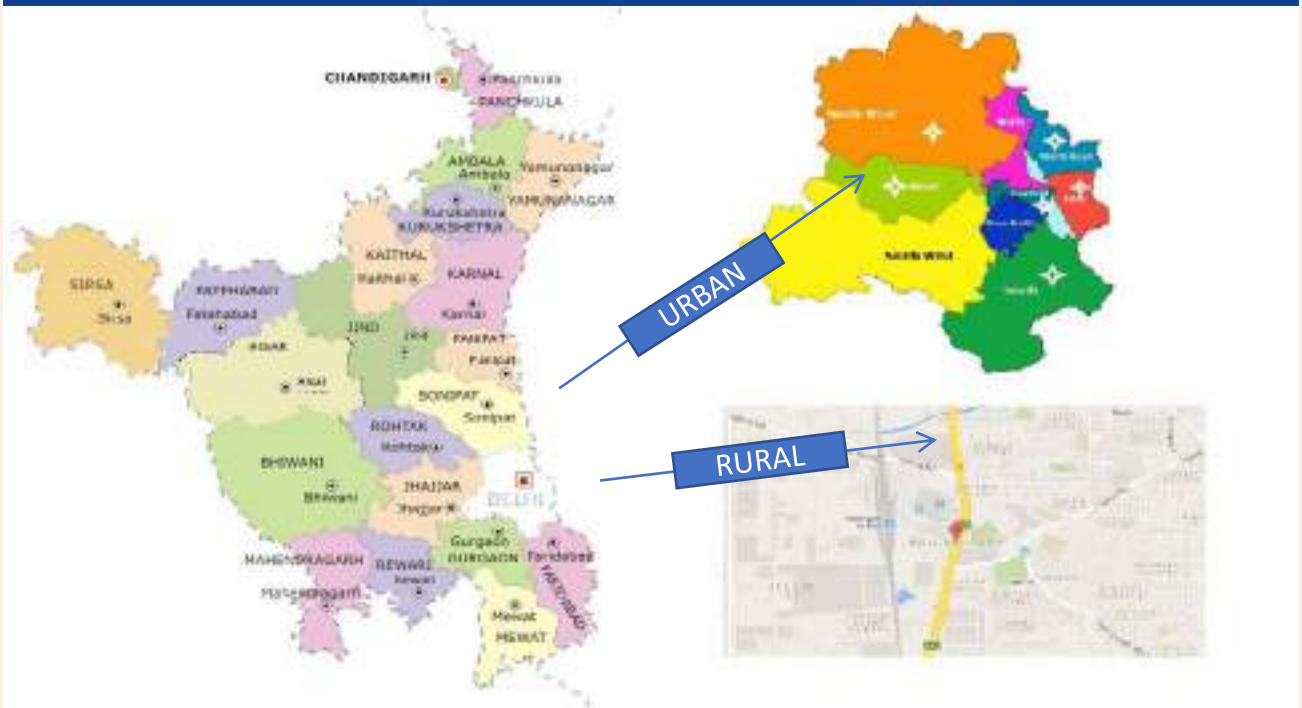


The 40% change in age-standardised DALY rate for diabetes (1990 to 2016) was the highest increase among major NCDs

Global burden of disease study 2016

ICMR – Urban Rural study on CVD risk Factors: Delhi and Haryana

- A representative cross-sectional survey (1991-1994; repeated 2010-2012) in the **same population**
- Urban Delhi and Rural Haryana (Ballabgarh), adults age 35-64 y



20 year trends: Distribution of FPG and DM Prevalence (Delhi-NCR)

Age and sex standardized prevalence of diabetes: Percentage (95%C.I)				
	Urban		Rural	
	1991-1994	2010-2012	1991-1994	2010-2012
Male	13.2 (11.4- 15.0)	22.5 (19.6-25.4)	2.9 (1.5- 4.3)	12.0 (9.5-14.5)
Female	12.2 (10.6- 13.8)	17.9 (15.4- 20.4)	3.0 (1.6- 4.4)	7.1 (5.1- 9.1)
Total	12.7 (11.5-13.9)	20.2 (18.2- 22.2)	3.0 (2.0- 4.0)	9.6 (8.0-11.2)

FPG-Fasting Plasma Glucose; Survey 1- 1991-1994; Survey 2- 2010-2012

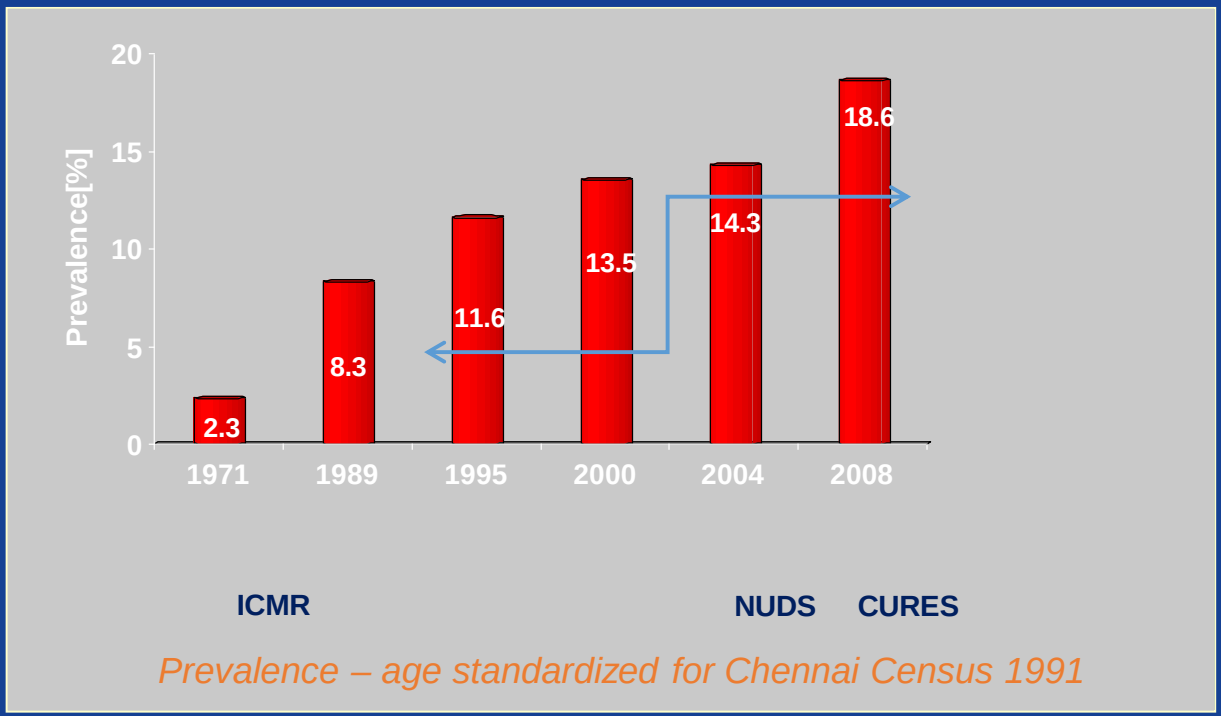
Prabhakaran D et al, Global Heart 2017

Rising Prevalence Of Diabetes In Urban India

Chennai Urban Rural Epidemiology Study [CURES] is compared with other studies conducted on representative population of Chennai city

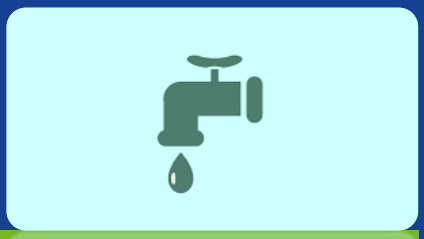
1989 - 2005

Within a span of 14 years, the prevalence of diabetes increased by 72.3%



Prevalence – age standardized for Chennai Census 1991

Mohan V et al, CURES, Diabetologia, 2006; 49: 1175 – 1178
Ramachandran A et al, Diabetes Care, 2008; 31: 893 - 898



Incidence of diabetes in India

Incidence rates of diabetes and pre-diabetes (CURES study)

Glucose tolerance status at baseline	n	Person-Years	Glucose tolerance status at 10-year follow-up	Outcomes (n)	Rate per 1000 person-years
NGT	1077	9398	i-IGT	55	5.9
		9398	i-IFG	161	17.1
		9398	IFG-IGT	61	6.5
		9398	i-IFG, i-IGT, or IFG-IGT	277	29.5
		9398	Diabetes	209	22.2

Anjana RM et al. Diabetes Care. 2015. 38: 1441 - 48

Similar incidence : Study of Life Style Diseases in Central Kerala (SLICK) [*Vijayakumar G et al; 2019*]

Rural Puducherry study: incidence rate of 21.5/1000 person years [*Ghorpade AG et al 2013]*

Incidence: Comparison of CARRS and ARIC studies

	South Asians (CARRS)			US Whites			Incidence rate ratio
	New cases	PYR	Incidence(95%CI)	New cases	PYR	Incidence (95%CI)	US whites vs South Asians
Men							
Total (Crude)	183	6939	26.4 (22.8,30.5)	583	35914	16.2 (15.0, 17.6)	1.62 (1.37,1.92)
Total (Age standardised)			**26.0** (22.2,29.8)			**16.1**(14.8,17.4)	
Women							
Total (Crude)	206	6228	33.1 (28.9,37.9)	453	42380	10.7 (9.7, 11.7)	3.09 (2.61,3.66)
Total (Age standardised)			**31.9** (27.5,36.2)			**11.3** (10.2,12.3)	
Both sexes							
Total (Crude)	389	13167	29.5 (26.7,32.6)	1036	78294	13.2 (12.5, 14.1)	2.23 (2.13, 2.31)
Total (Age standardised)			**28.7** (25.8,31.5)			**13.5** (12.7,14.3)	

Venkat Narayan et al; Unpublished data

In BMI <25 kg/m^2, DM incidence:
- 2.9 times higher in South Asian men cf. White men
- 5.3 times in SA women cf. White women

Life time risk of diabetes in India

Methods and Results

Diabetologia
https://doi.org/10.1007/s00125-020-05330-1

ARTICLE

Lifetime risk of diabetes in metropolitan cities in India

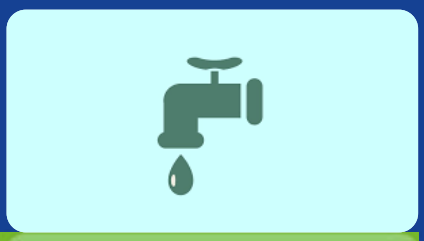
Shammi Luhar[1,2] · Dimple Kondal[3] · Rebecca Jones[4] · Ranjit M. Anjana[5] · Shivani A. Patel[4] · Sanjay Kinra[7] · Lynda Clarke[2] · Mohammed K. Ali[8] · Dorairaj Prabhakaran[3,4] · M. Masood Kadir[9] · Nikhil Tandon[10] · Viswanathan Mohan[5] · K. M. Venkat Narayan[6]

Received: 29 July 2020 / Accepted: 5 October 2020

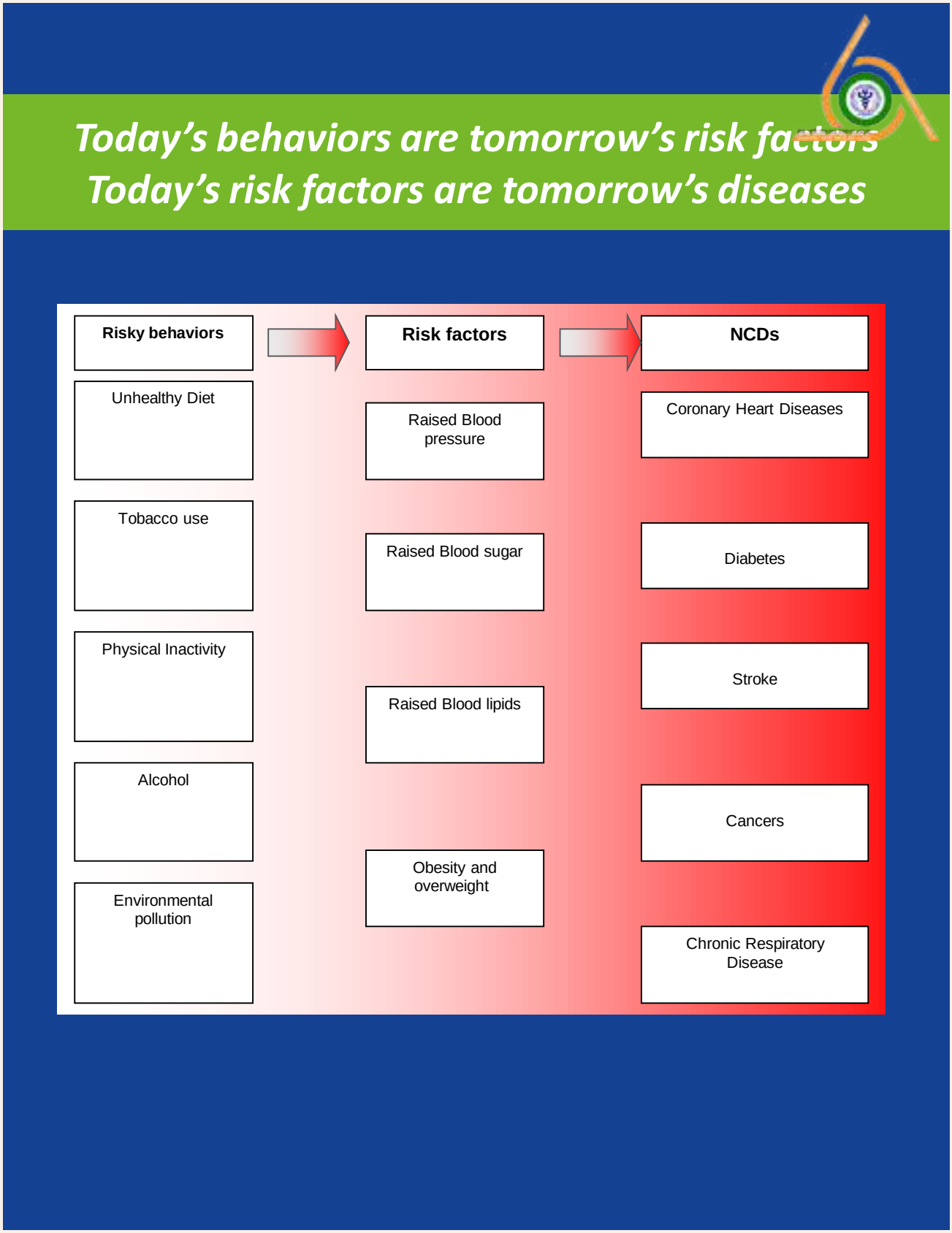
- Incidence rates of DM in urban India: Centre for Cardio metabolic Risk Reduction in South Asia (CARRS: 2010–2018)
- Rates of mortality from period life tables reported by the Government of India (2014)
- Prevalence of DM from the ICMR-INDIAB (2008–2015)
- A Markov simulation model was adopted to estimate age-, sex- and BMI-specific lifetime risk of developing diabetes and diabetes-free life expectancy
- **Lifetime risk (95% CI) of diabetes in 20-year-old men and women was 55.5% and 64.6%, respectively**

Lifetime risk of developing diabetes by global BMI cut points in Indian metropolitan cities

BMI group	Lifetime risk	
	Men	Women
Underweight/normal weight (BMI <25 kg/m^2)		
Age 20 years	41.2 (36.7, 45.7)	51.6 (46, 58.4)
Age 40 years	34.5 (30.7, 38.8)	47.1 (40.5, 54.6)
Age 60 years	21.5 (16.7, 27.5)	30.7 (23.2, 40.1)
Overweight (BMI ≥25 kg/m^2 to <30 kg/m^2)		
Age 20 years	71.3 (64.6, 77.6)	71.0 (61.0, 80.6)
Age 40 years	63.8 (54.0, 72.1)	64.9 (54.1, 77.8)
Age 60 years	44.9 (32.2, 56.1)	45.9 (30.8, 65.6)
Obese (BMI ≥30 kg/m^2)		
Age 20 years	86.9 (75.4, 93.8)	86.0 (76.6, 91.5)
Age 40 years	77.2 (56.7, 87.8)	79.1 (65.6, 88.8)
Age 60 years	55.9 (34.1, 74.6)	58.5 (32.9, 78.6)
Total population		
Age 20 years	55.5 (51.6, 59.7)	64.6 (60.0, 69.5)
Age 40 years	47.3 (42.4, 52.3)	59.2 (52.4, 64.9)
Age 60 years	27.5 (23.1, 32.4)	37.7 (30.1, 46.7)



Diabetes – Risk Factors


Today's behaviors are tomorrow's risk factors
Today's risk factors are tomorrow's diseases
Risky behaviors
Unhealthy Diet
Tobacco use
Physical Inactivity
Alcohol
Environmental pollution
Risk factors
Raised Blood pressure
Raised Blood sugar
Raised Blood lipids
Obesity and overweight
NCDs
Coronary Heart Diseases
Diabetes
Stroke
Cancers
Chronic Respiratory Disease

Risk Factors

Type 1

- Autoimmune disease - exact cause unknown.

Type 2

- Age
- Family history
- Overweight/obesity
- Physical inactivity
- Race/ethnicity (South Asians develop diabetes at lower BMI)
- Previous history of gestational diabetes

HAVING TWO OR MORE RISK FACTORS DRASTICALLY INCREASES THE RISK OF DIABETES

Risk factors for DM

Factors	Overall (n=16287)	
	OR	95%CI
Age, per 10 year increment	2.27	[2.15, 2.40]
Family history of diabetes	2.17	[1.88, 2.50]
Generalized obesity [BMI ≥25 kg/m^2]	1.62	[1.33, 1.98]
Abdominal obesity [Waist ≥90/80 cm]	1.82	[1.48, 2.24]
Waist to height ratio [ratio ≥0.5]	1.46	[1.18, 1.79]
Body fat (%) [male ≥25% ; female ≥30%]	1.21	[1.02, 1.44]
HT [self-reported and/or BP ≥140/90 mm Hg]	1.38	[1.13, 1.68]
Hypercholesterolemia [Chol. ≥200 mg/dl]	1.30	[1.12, 1.49]
Hypertriglyceridemia [TG ≥150 mg/dl]	2.56	[2.20, 2.98]
Low HDL cholesterol [HDL-C <40/50 mg/dl	1.34	[1.17, 1.53]

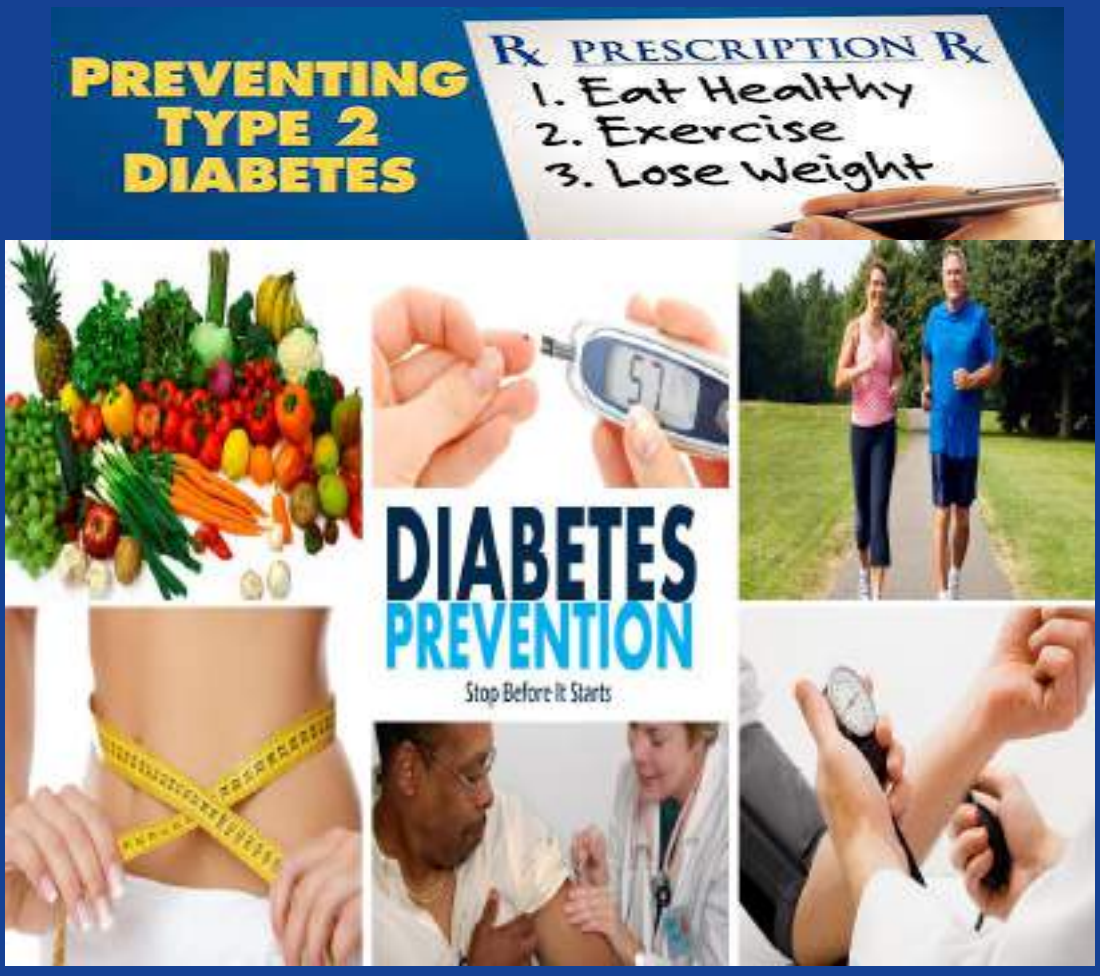
South Asians: A unique phenotype to examine the Obesity-DM discordance?

Risk Factor	CARRS 2010/2011 Baseline (n=10363)	NHANES 2009-2010 U.S. Born Whites (n=836)
Age at assessment (y)	38.8	42.5
Waist circumference (cm)	85.3	99.0
Body mass index (kg/m^2)	25.4	28.7
Systolic blood pressure (mm Hg)	120.7	118.3
Diastolic blood pressure (mm Hg)	80.6	71.4
Total cholesterol (mg/dL)	177.5	193.2
Triglycerides (mg/dL)	142.9	135.7
HDL (mg/dL)	43.2	52.5
Fasting blood glucose (mg/dL)	105.8	101.7
HbA1c (%)	6.1	5.5

Patel, S. et al, Unpublished data

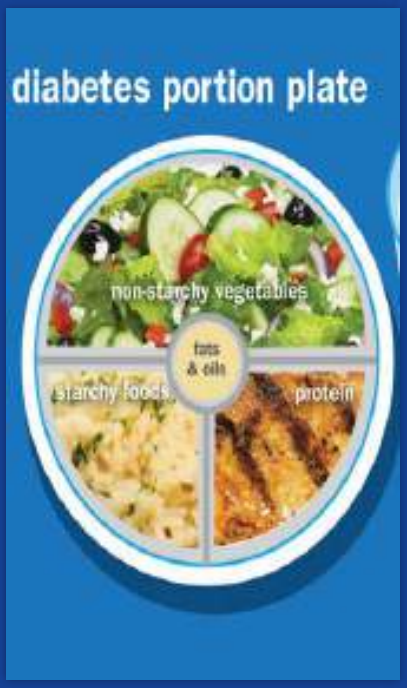
Preventing diabetes

Prevention



- Diet
- Physical Activity
- Salt Intake
- Weight Management
- Smoking and Alcohol Cessation
- Regular Follow Up

Counselling for Diabetes and Hypertension



5-6 Servings of Fruit and Vegetable per day

Fruits

Eat Less

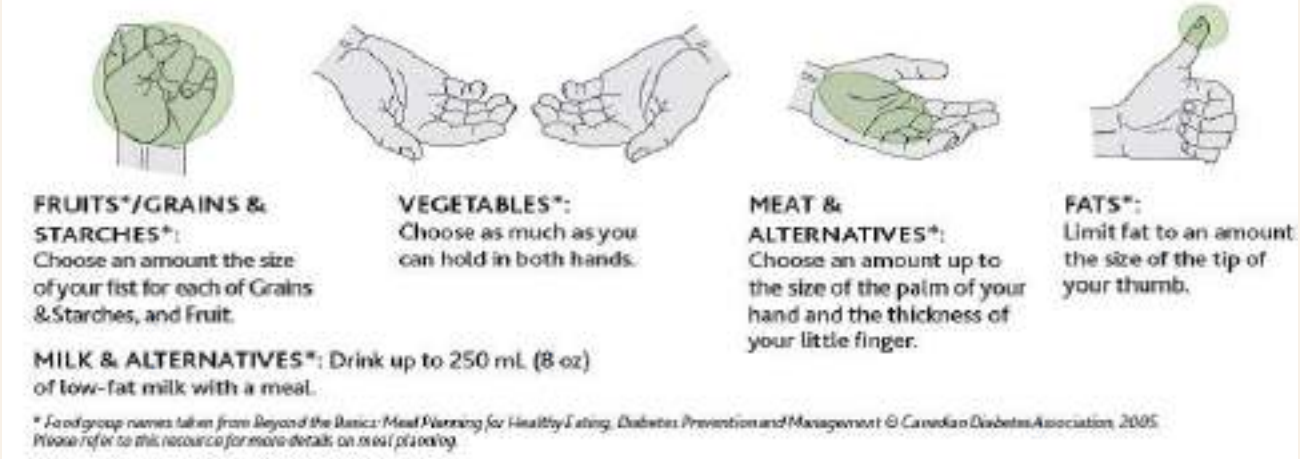
Eat Moderately

Vegetables

Eat Less

Eat Moderately

Hand Method



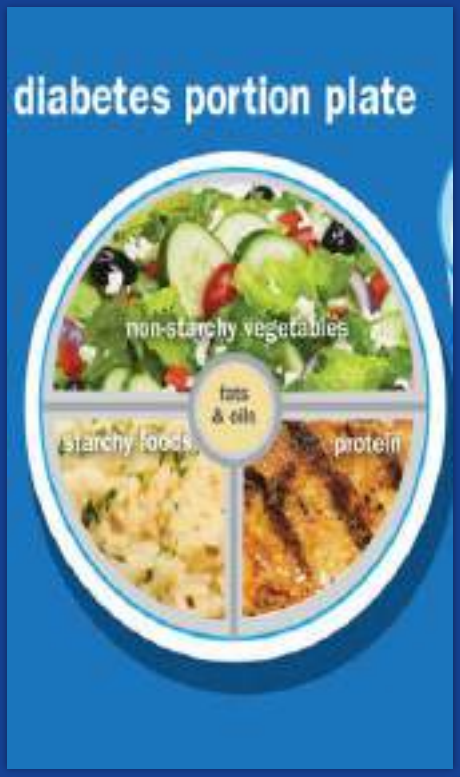
- Carbohydrate – Equal to the size of your two fists (includes grains and starches)
- Fruit- Equal to one fist
- Proteins - Amount equal to the size of your palm; thickness equal to your little finger
- Vegetables – Equal as much you can hold in your both hands
- Fat- Equal to the size of your tip of your thumb

Plate Method

- 50% Non starchy fruit and vegetables (Carrot, Cabbage, Cauliflower, Broccoli , Spinach, Tomato)
- 25% Grains and starchy food (Grains, Rice, Potato, Corns , Yam, Green Peas, Pasta)
- 25% Proteins (Fish, Egg, Cheese, Beans and Lentils)

+

- Drinks (Unsweetened tea or coffee)



Healthy Eating Pyramid

Level 1- Fruits and Vegetables

Level 2- Carbohydrates

Level 3-Proteins

Level 4- Fats and Nuts

Level 5- High Calorie Food

Physical Activity

Work Related

Leisure Related

Walk

- Minimum of 30 minutes walk and 5 days a of a week
- Brisk walk- minimum of 3 km in 30 minutes

Conclusions

- Rapid increase in prevalence of DM in the previous 25 years
- Heterogeneity: regional; urban vs rural
- Catch up growth: rural; low ETL states
- Incidence rates in normal BMI: exceed Pima!
- Incidence rates: 3-5 times higher cf. white Caucasians
- Lifetime risk of DM in 20-year-old men and women:
  - 55.5% and 64.6%, respectively
- Today's risk factors are tomorrow's disease: use this knowledge to prevent disease

"There are no incurable diseases only a lack of will"

Avicenna (Ibn Sina); 980-1037

THANK YOU

Healthy living at the time of COVID with particular reference to Obesity & Diabetes

Dr. V. Mohan, the second speaker of the Webinar spoke on "Healthy living at the time of COVID concerning Obesity and Diabetes". Though Covid 19 was responsible for a large number of deaths, people with co-morbidities like diabetes, obesity, and heart disease were the worst affected. Covid 19 reminded us of the importance of diabetes. He observed that people with uncontrolled diabetes developed a severe form of Covid-19. He further observed that in people with old age, the prognosis of type 2 diabetes was worse.

The criteria for diagnosis of diabetes are Fasting plasma glucose ≥ 126mg/dl on more than two occasions, symptoms of diabetes + random plasma glucose ≥ 200mg/dl (more than two occasions), two-hour plasma glucose during GTT ≥ 200 mg/dl, or when glycated hemoglobin or HbA1c is ≥6.5%. The symptoms of diabetes include delayed healing of wounds, frequent urination, excessive thirst, tiredness, excessive hunger, itching in private parts, weight loss, and persistent ache in the limbs. These symptoms appear in the advanced stage of the disease. However, 50 % of diabetics do not have symptoms. Diabetes is as bad a killer as cancer and in some cases even worse once the kidney is affected. There is a long period between the normal and diabetic stage. The pre-diabetic period provides a golden opportunity to reverse diabetes. If the patient is diagnosed at the pre-diabetic stage, he is almost imminently reversible. The more you go to the diabetes stage, the reversibility becomes less and less possible and when one reaches the stage of complication, the reversibility is not possible at all. At the stage of complication, the organs like the kidney, eye, heart, and feet get affected. It is advisable to limit the damage at the complication stage. So, it all depends on when the medical check-up is done. And that is why doctors always recommend an annual medical check-up so that the disease is detected at an early stage.

Patients of diabetes essentially should also take the usual precautions taken for covid-19 such as social distancing, hand washing, wearing a mask, maintaining good respiratory etiquettes. They also require taking some additional precautions. They should be asked not to panic. They should keep their blood glucose well controlled and get their sugar checked at regular intervals to ensure good control. Eat healthy food by including more vegetables, fruits, and proteins. Exercise regularly. Do pranayama which will help increase one's lung function and decrease stress. A study conducted in Chennai on "High prevalence of Metabolic Syndrome and Cardiovascular Risk among Police Personnel compared to General Population in India" by Shabana Tharkar et al found a significantly higher prevalence of metabolic syndrome and other cardiometabolic abnormalities among the police personnel. Further research is required to determine the causative factors and effective intervention strategies must be planned to keep the police force healthy and vigilant. Another study from Kolkata on the "Prevalence of hypertension and its associated risk factors among Kolkata-based policemen: a socio-physiological study" by Anurupa Sen et al revealed that a sizable number of Kolkata based policemen are hypertensive than civilians and lifestyle modifications along with health care strategies must be planned for this special population.

The five tips for improving immunity and healthy living are Diet-eat healthy and nutritious food, exercise regularly, reduce stress and anxiety, sleep well and control chronic conditions like diabetes, hypertension, etc. One should have good nutrition practice. Good nutritious practices include eating well, eating slowly, eating in time, eating right and, having completely balanced nutrition. Complete balanced nutrition can be obtained by using the plate method wherein 50% of the plate consists of vegetables, 25% of the plate should have pulses and the remaining only 25% should consist of cereals like rice or wheat. To have a healthy diet, one has to continue the traditional meal pattern. Eat less Fast food. Coarse cereals should be preferred to refined flour. Include fiber-rich food. One should have a generous quantity of vegetables, pulses, and sprouts. Fried food and sweets should be avoided. Use traditional oils like groundnut oil, sesame of Mustard oil. Pizza, bakery food, and refined flour like maida and Rava should be minimized. Exercise is important to lead a healthy life because, the longer the belt, the shorter the life, and the shorter the belt, the longer the life. Obesity is harmful. It leads to stroke, cancer, type 2 diabetes, gout, gallbladder issues osteoarthritis, etc. Exercise helps in reducing the blood sugar level, total cholesterol and LDL-cholesterol values, triglycerides, blood pressure, weight, body fat, insulin resistance. Exercise also helps to alleviate stress and prevents diabetes complications. The FAR principle should be adopted to remember exercise. F stands for flexibility-one should be able to bend sideways, movement of your neck spine and bend forward and touch the ground. This should be done every day. A stands for aerobic exercises- in this type of exercise, one should move from one place to another it can be walking, jogging, swimming, cycling, or anything that helps movement. R stands for resistance training. This is done by lifting weights and it helps to build up your shoulder muscles, pectoral muscles, and your arms-your biceps and your triceps. Try to take 10, 000 steps a day. You can do 10,000 steps if you go for a walk either in the morning or in the evening. Stress reduction is very important. To reduce stress one can do meditation, yoga, recreational activities, counseling, and proper planning and time management. One must live a life of moderation and do nothing to extremes.

Work-life balance is very important. Don't neglect your family. Your family gives you social support. Sleeping well is very important. One should get 6 to 8 hours of good-quality sleep. One should go to sleep between 10 and 12 pm. going to bed very late after midnight can adversely affect your health. Yoga helps to improve your memory; it increases your concentration and relieves stress and anxiety. Develop a hobby, learn to relax, find inner peace and that is spirituality. Trying to help another human being is also a part of spirituality.

The four pillars for the management of diabetes are diet, exercise, education, and medicines. Freestyle Libre Pro Flash Glucose Monitoring system is a non-invasive new technology now available which provides retrospective data of blood glucose level up to 2 weeks. By this method, blood glucose can be monitored 24x7 for two weeks. This also helps in deriving TIR (time in range). For well-controlled diabetes, the TIR should be >70%. Controlled diabetes should have

Fasting Plasma Glucose: 100-120 mg/dl

Post prandial plasma glucose: 120-160 mg/dl

HbA1c : <7%

TIR : > 70%

Uncontrolled diabetes can lead to complications such as Coronary Artery Disease (CAD), Peripheral Vascular Disease (PVD), Retinopathy, Nephropathy, and Neuropathy.

Dr. V. Mohan concluded his talk with a message of healthy living with attention to diet, exercise, and the control of chronic conditions like diabetes and hypertension.

In response to a question raised by Shri Jaiswal on the consumption of bakery items, Dr. Mohan said that unrefined whole wheat grain bread should be taken because of its low glycaemic index compared to refined white bread. Responding to another query raised by Shri Jaiswal on whether the law enforcement agencies and students who work late in the night could compensate for the lost sleep by sleeping during day time, Dr. Mohan replied that occupational exigencies are different and during routine days one should try to have as much sleep at the normal time as possible because it will build up your immunity and strength and keep you healthier. So, as far as possible one should try to get sleep between 10 pm and 12 midnight, and that also for a minimum of 6 hours of sleep.

Shri Sanjay Kumar Bhagat, Sr. SP PHQ, J&K wanted to know which was more dangerous for a known diabetic case, a rise in glucose level, or having hypoglycemia. Dr. Mohan said that both the situations were not good the hypoglycemia part will be having an instantaneous effect, it will be sudden. In the hypoglycaemic condition when the sugar level is around 50 mg/dl one will get sudden shivering and the brain will not work and one will start blabbering but it can be relieved immediately by taking food. In hyperglycemia, when the glucose level is high, the effects take the time it doesn't immediately cause damage but over time your organs get damaged. In a younger person, one doesn't have to worry so much about hypoglycemia. If he eats he will become alright. If a person is 70 years or elder he might get a severe low sugar reaction such as stroke or heart attack under hypoglycaemic conditions. So, both hyperglycemia and hypoglycemia are dangerous. Depending on the patient the doctor will have to individualize the treatment of diabetes.

Sh M.K. Shukla, DYSP (HQ/ESTT) from Andaman & Nicobar Police wanted to know whether it is true that by taking chapatti (Wheat) which contains gluten, the beta cells of the pancreas are damaged and thus makes a person diabetic. Dr. Mohan responded that this view which is seen in social media is not correct. If you are sensitive to gluten then you will have diarrhea. The moment you take chapatti you will have stomach pain, you will have to bloat and so you will have to get gluten-free products. This is a different disease altogether and has nothing to do with diabetes. If you are allergic to gluten don't take it. It is not the rice and wheat that are responsible for diabetes but the amount of rice and the amount of wheat we take that is important.

HEALTHY LIVING AT THE TIME OF COVID WITH REFERENCE TO OBESITY AND DIABETES

Dr.V.Mohan., MD., Ph.D., D.Sc., D.Sc (Hon. Causa),
FRCP (London, Edinburgh, Glasgow & Ireland), FNASc., FASc., FNA, FACE, FTWAS, MACP, FRSE

CHAIRMAN
DR.MOHAN'S DIABETES SPECIALITIES CENTRE,
GOPALAPURAM, CHENNAI

IDF CENTRE OF EXCELLENCE IN DIABETES CARE

PRESIDENT & DIRECTOR
MADRAS DIABETES RESEARCH FOUNDATION,
SIRUSERI, CHENNAI

ICMR CENTRE FOR ADVANCED RESEARCH ON DIABETES

MY HEARTFELT THANKS TO

Shri Karuna Sagar, Dir/IG (Mod), BPR&D

Shri Santosh Mehra, ADG, BPR&D

Shri V S K Kaumudi, DG, BPR&D

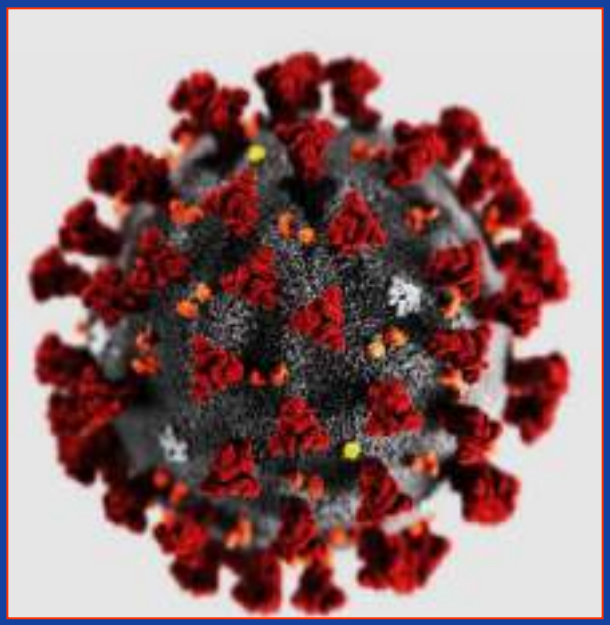
Shri B Shankar Jaiswal, DIG, BPR&D

Dr. Ajit Mukherjee, PSO(LS), BPR&D

&

Organizing Committee of this meeting

COVID – 19



Dr. Mohan's DIABETES SPECIALITIES CENTRE

Q : Are people with diabetes more likely develop more severe form of COVID – 19?

A :

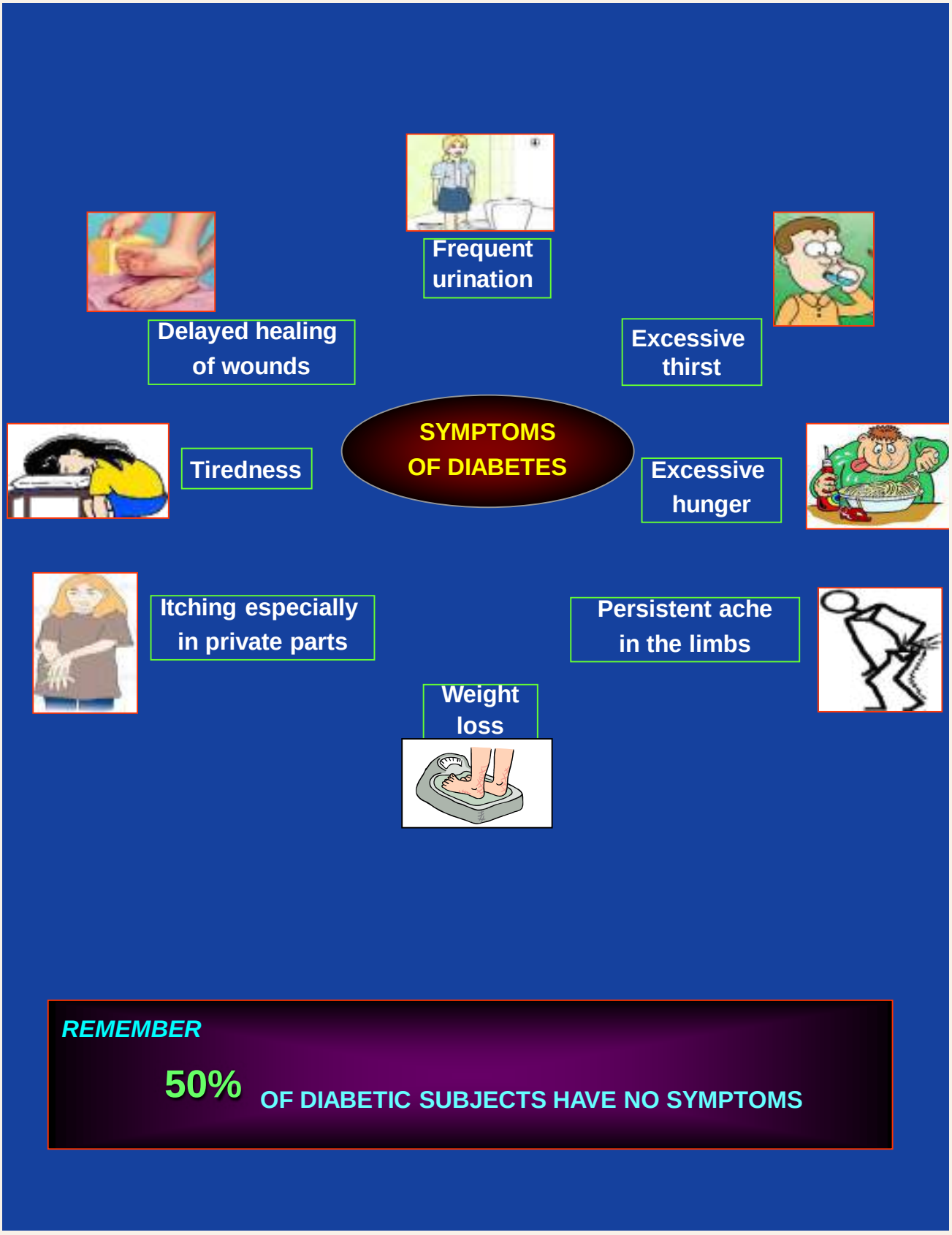
- If diabetes is uncontrolled probably YES.
- However, remember people with type 2 diabetes are usually older.
- Old age by itself makes the prognosis worse.
- Hence both by virtue of the diabetes and the age, the prognosis could be worse.

WHAT IS DIABETES?

IS HIGH BLOOD SUGAR (HYPERGLYCAEMIA)

DIAGNOSTIC CRITERIA FOR DIABETES

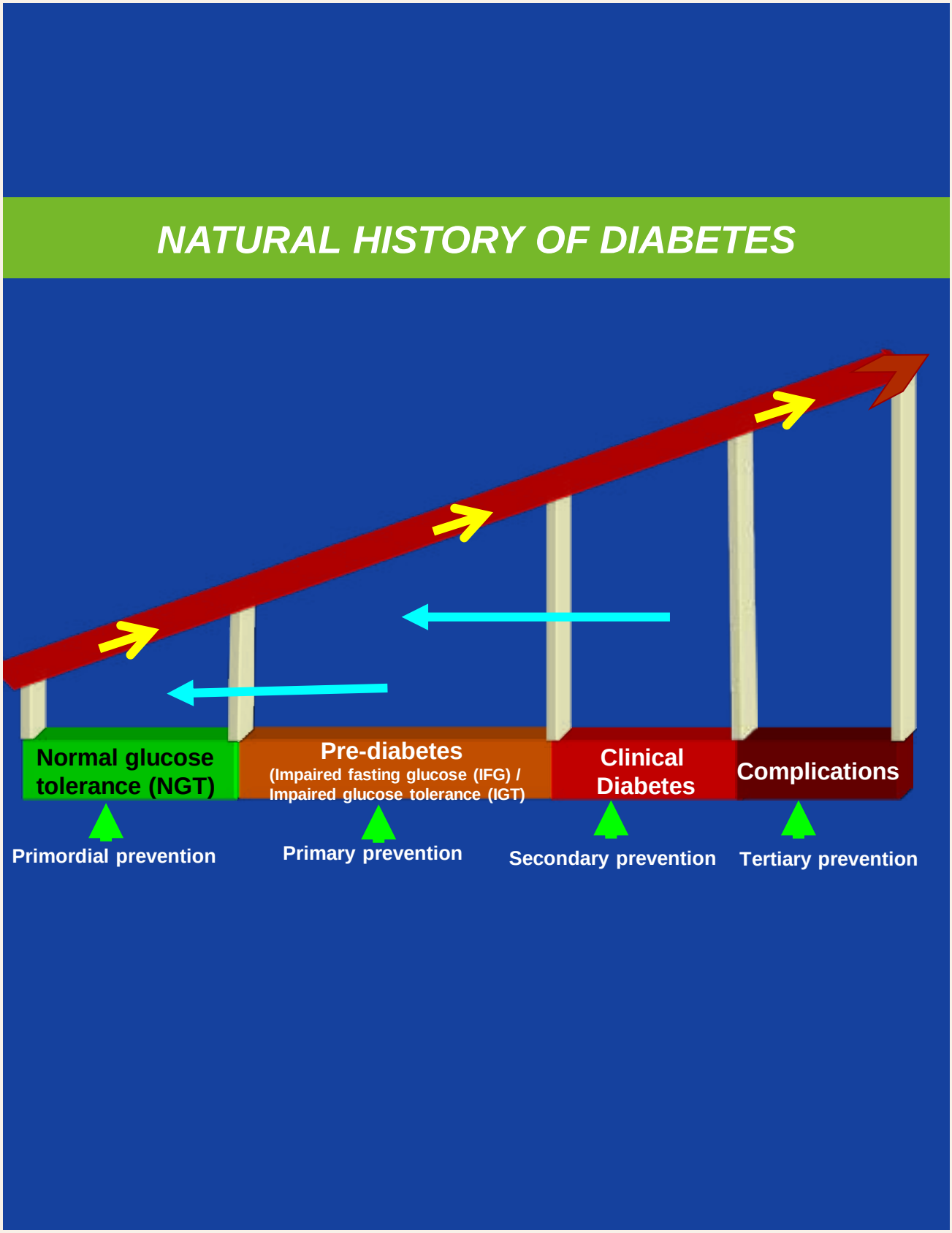
- Fasting Plasma glucose ≥ 126mg/dl (more than 2 occasions)
- Symptoms of diabetes + Random Plasma glucose ≥ 200mg/dl (more than 2 occasions)
- 2 Hour Plasma glucose during GTT ≥ 200mg/dl
- Glycated Hemoglobin or HbA1c ≥ 6.5%


Frequent urination
Delayed healing of wounds
Excessive thirst
SYMPTOMS OF DIABETES
Tiredness
Excessive hunger
Itching especially in private parts
Persistent ache in the limbs
Weight loss
REMEMBER
50% OF DIABETIC SUBJECTS HAVE NO SYMPTOMS

Classification of glucose tolerance states

State	FPG level (mg/dl)	2-h plasma glucose in OGTT (mg/dl)*	HbA1c (%)
Normal	<100	<140	< 5.7%
Pre-diabetes (Combined IFG/IGT)	100–125	140–199	5.7 – 6.4%
Diabetes	≥ 126mg/dl	≥ 200 mg/dl	≥ 6.5%

* Standard 75-g OGTT


NATURAL HISTORY OF DIABETES
Normal glucose tolerance (NGT)
Pre-diabetes
(Impaired fasting glucose (IFG) / Impaired glucose tolerance (IGT)
Clinical Diabetes
Complications
Primordial prevention
Primary prevention
Secondary prevention
Tertiary prevention

Q : What should people do to prevent COVID – 19?

A :

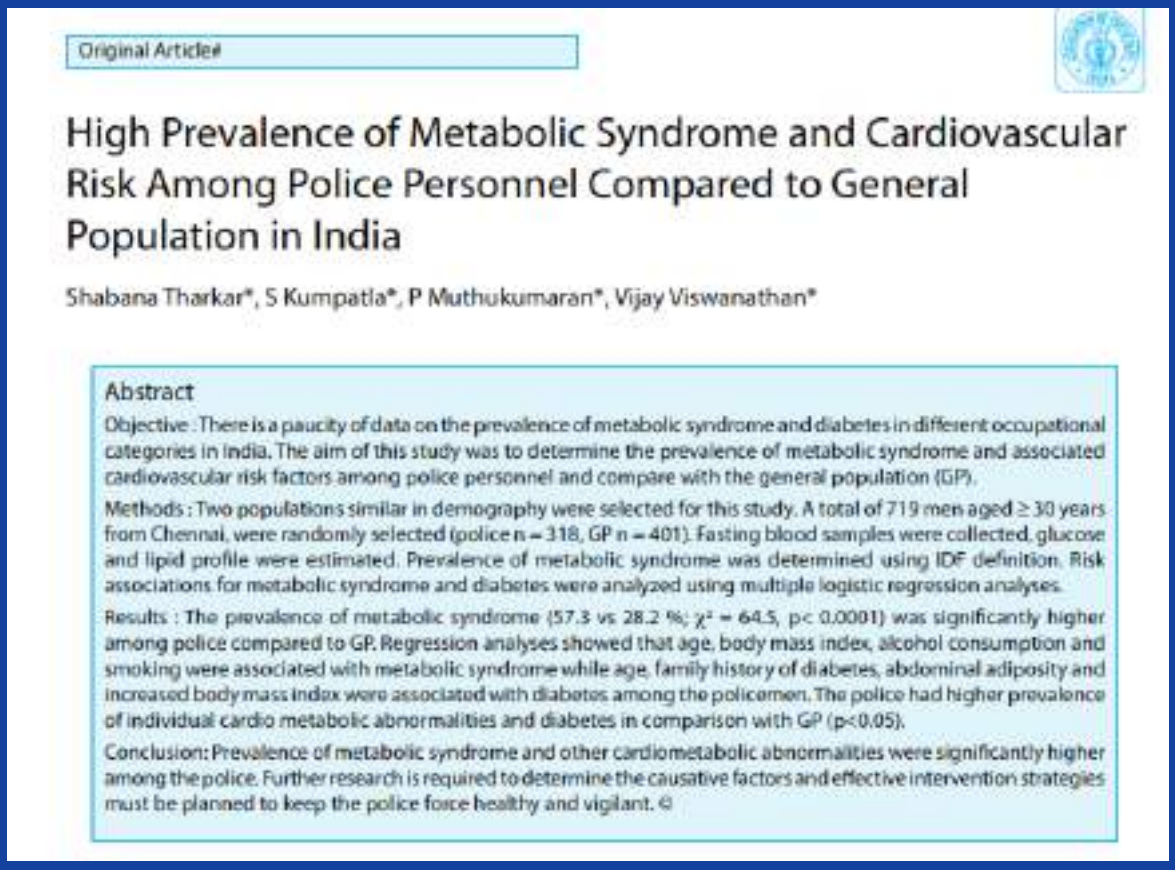
- **First lets tell patients not to panic.**
- **Practice same principles for prevention.**
  - ✓ **Social distancing**
  - ✓ **Frequent hand washing**
  - ✓ **Wear a mask if you visit a health facility or have a cough / fever / cold or in touch with anyone who has these symptoms**
  - ✓ **Good respiratory etiquette, eg., Coughing, Sneezing into elbow**

Q : What extra precautions should people with diabetes take ?

A :

1. Control diabetes well.
2. Check sugars often to ensure good control.
3. Eat healthy – include more
   - Vegetables
   - Fruit
   - Protein
4. Exercise regularly.
5. Pranayama
   - Improves lung function
   - Decreases stress

Studies - Police personnel



Original Article#

High Prevalence of Metabolic Syndrome and Cardiovascular Risk Among Police Personnel Compared to General Population in India

Shabana Tharkar*, S Kumpatla*, P Muthukumaran*, Vijay Viswanathan*

Abstract

Objective : There is a paucity of data on the prevalence of metabolic syndrome and diabetes in different occupational categories in India. The aim of this study was to determine the prevalence of metabolic syndrome and associated cardiovascular risk factors among police personnel and compare with the general population (GP).

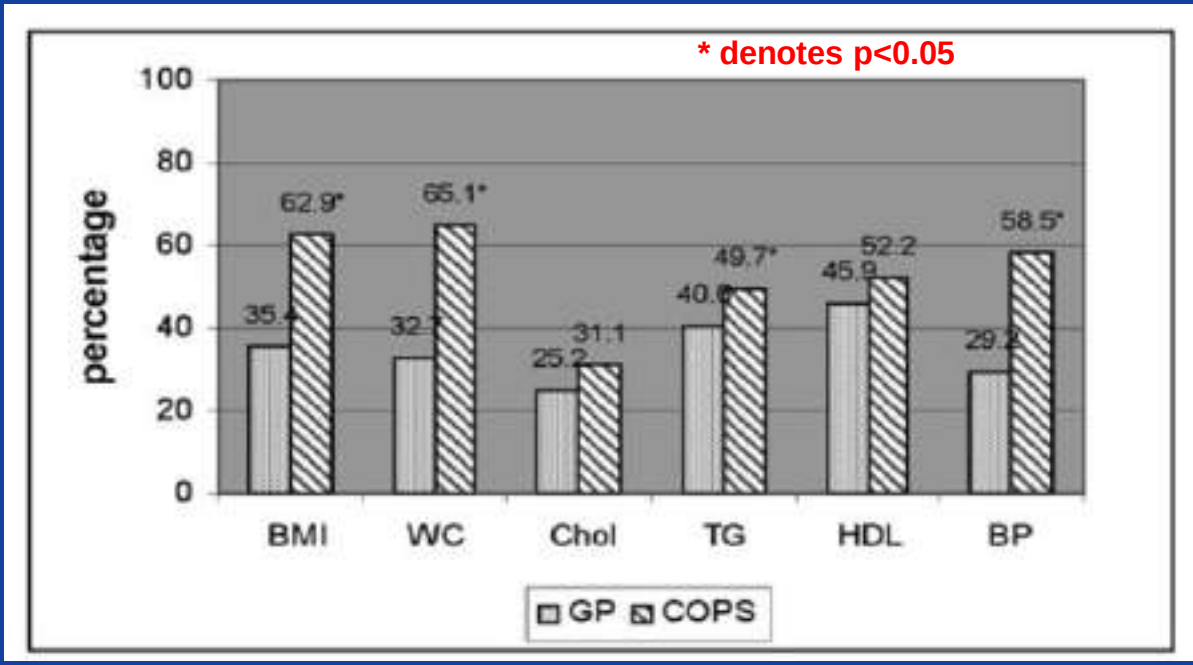
Methods : Two populations similar in demography were selected for this study. A total of 719 men aged ≥ 30 years from Chennai, were randomly selected (police n = 318, GP n = 401). Fasting blood samples were collected, glucose and lipid profile were estimated. Prevalence of metabolic syndrome was determined using IDF definition. Risk associations for metabolic syndrome and diabetes were analyzed using multiple logistic regression analyses.

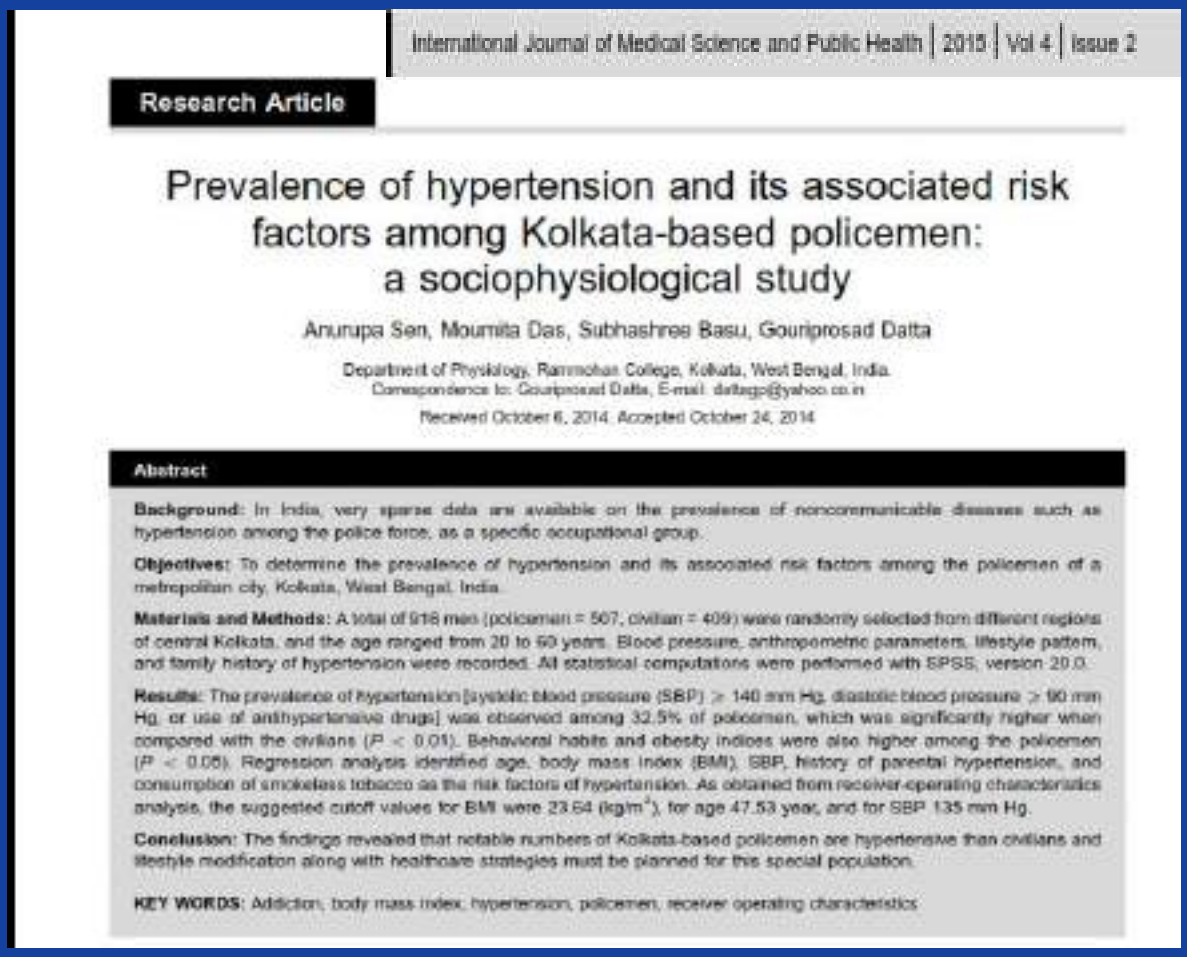
Results : The prevalence of metabolic syndrome (57.3 vs 28.2 %; χ^2 = 64.5, p< 0.0001) was significantly higher among police compared to GP. Regression analyses showed that age, body mass index, alcohol consumption and smoking were associated with metabolic syndrome while age, family history of diabetes, abdominal adiposity and increased body mass index were associated with diabetes among the policemen. The police had higher prevalence of individual cardio metabolic abnormalities and diabetes in comparison with GP (p<0.05).

Conclusion: Prevalence of metabolic syndrome and other cardiometabolic abnormalities were significantly higher among the police. Further research is required to determine the causative factors and effective intervention strategies must be planned to keep the police force healthy and vigilant. ©

Conclusion: Prevalence of metabolic syndrome and other cardiometabolic abnormalities were significantly higher among the police. Further research is required to determine the causative factors and effective intervention strategies must be planned to keep the police force healthy and vigilant.

Prevalence of individual cardio metabolic abnormalities among the police (cops) in comparison with general population (GP)





International Journal of Medical Science and Public Health | 2015 | Vol 4 | Issue 2

Research Article

Prevalence of hypertension and its associated risk factors among Kolkata-based policemen: a sociophysiological study

Anurupa Sen, Moumita Das, Subhashree Basu, Gouriprosad Datta

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Received October 6, 2014. Accepted October 24, 2014

Abstract

Background: In India, very sparse data are available on the prevalence of noncommunicable diseases such as hypertension among the police force, as a specific occupational group.

Objectives: To determine the prevalence of hypertension and its associated risk factors among the policemen of a metropolitan city, Kolkata, West Bengal, India.

Materials and Methods: A total of 916 men (policemen = 507; civilian = 409) were randomly selected from different regions of central Kolkata, and the age ranged from 20 to 60 years. Blood pressure, anthropometric parameters, lifestyle pattern, and family history of hypertension were recorded. All statistical computations were performed with SPSS, version 20.0.

Results: The prevalence of hypertension [systolic blood pressure (SBP) ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, or use of antihypertensive drugs] was observed among 32.5% of policemen, which was significantly higher when compared with the civilians ($P < 0.01$). Behavioral habits and obesity indices were also higher among the policemen ($P < 0.05$). Regression analysis identified age, body mass index (BMI), SBP, history of parental hypertension, and consumption of smokeless tobacco as the risk factors of hypertension. As obtained from receiver-operating characteristics analysis, the suggested cutoff values for BMI were 23.64 (kg/m^2), for age 47.53 year, and for SBP 135 mm Hg.

Conclusion: The findings revealed that notable numbers of Kolkata-based policemen are hypertensive than civilians and lifestyle modification along with healthcare strategies must be planned for this special population.

KEY WORDS: Addiction, body mass index, hypertension, policemen, receiver operating characteristics

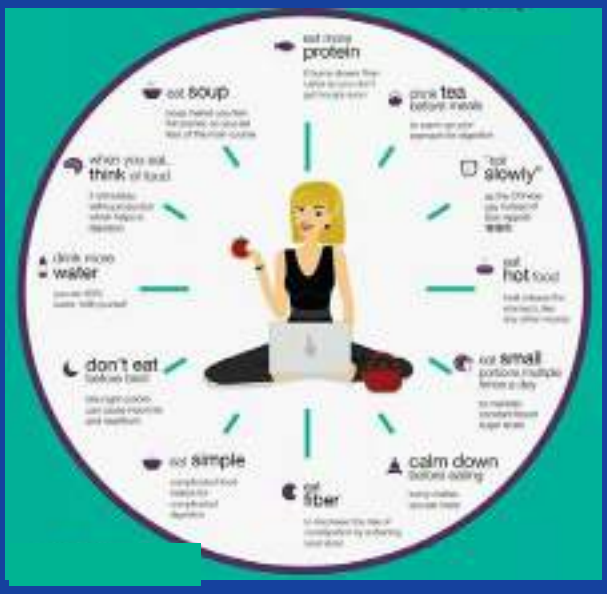
Conclusion: The findings revealed that notable numbers of Kolkata-based policemen are hypertensive than civilians and lifestyle modification along with healthcare strategies must be planned for this special population.

Five tips for improving immunity and healthy living

1. Diet - Eat healthy and nutritious food
2. Exercise regularly
3. Reduce stress and anxiety
4. Sleep well
5. Control chronic conditions like diabetes, hypertension, etc

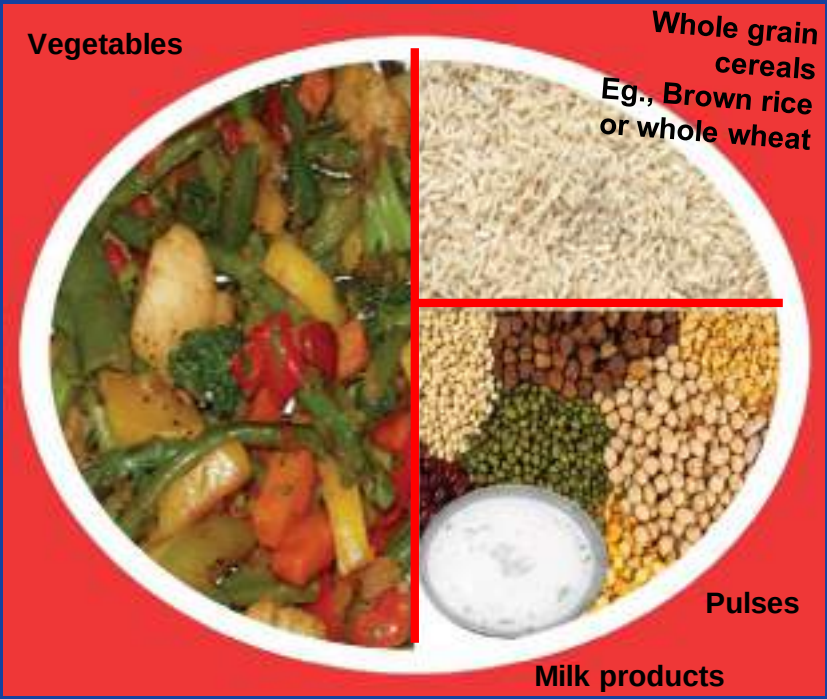
Diet

Good Nutrition Practice



- Eat well
- Eat Slowly
- Eat on Time
- Eat Right
- Have Complete Balanced Nutrition

Choose your plate



Divide your plate

- ***50% should be vegetables***
- ***25% should be pulses and***
- ***Only 25% cereals like rice or wheat***

USE MORE COLOURS IN YOUR DIET

RAINBOW COLOURS

INCLUDE

EXCLUDE

HEALTHY DIET

- Continue traditional meal pattern
- Decrease use of fast foods
- Use of coarse cereals as opposed to refined
- Generous use of vegetables, pulses and sprouts
- Decrease fried foods and sweets
- Use of traditional oils e.g. groundnut, sesame, mustard
- Decrease consumption of bakery foods
- Include fibre rich foods

Five tips for improving immunity and healthy living

1. Diet - Eat healthy and nutritious food
2. Exercise regularly
3. Reduce stress and anxiety
4. Sleep well
5. Control chronic conditions like diabetes, hypertension, etc

Longer the Belt, Shorter the Life

ROLE OF EXERCISE

- ↓ Blood sugar levels
- ↓ Total cholesterol and LDL-Cholesterol
- ↑ HDL-Cholesterol, ↓ Triglycerides
- ↓ Blood pressure
- ↓ Weight, body fat, and ↑ muscle mass
- ↓ Insulin resistance
- Alleviates stress
- Prevents diabetes complications

FAR principle

Flexibility

Aerobic Exercise

Resistance Training

Try to walk

10,000

steps / day.

(App available on your mobile phone)

SIMPLE TIPS

If in a safe place to walk,

- Walk whenever you make or receive calls on your mobile phone
- Take your dog for a walk
- In office every hour get up and walk a few steps

Five tips for improving immunity and healthy living

1. Diet - Eat healthy and nutritious food
2. Exercise regularly
3. Reduce stress and anxiety
4. Sleep well
5. Control chronic conditions like diabetes, hypertension, etc

STRESS REDUCTION

- Meditation
- Yoga
- Recreational activities
- Counseling
- Proper Planning and time management

- A total mind/body experience
- The basics of Yoga is that it combines dynamic breathing with strong, flowing movement for a high energy experience; relieves stress & leaves you feeling rejuvenated

"ONE MUST LIVE A LIFE OF MODERATION AND DO NOTHING IN EXTREMES"

Work life balance is very important

Don’t neglect your family !!

Five tips for improving immunity and healthy living

1. Diet - Eat healthy and nutritious food
2. Exercise regularly
3. Reduce stress and anxiety
4. Sleep well
5. Control chronic conditions like diabetes, hypertension, etc

Sleep is also important

Get 6 – 8 hours of good quality sleep

Try to get into bed by 11 pm latest !

Yoga helps

- Improve memory

- In concentration &

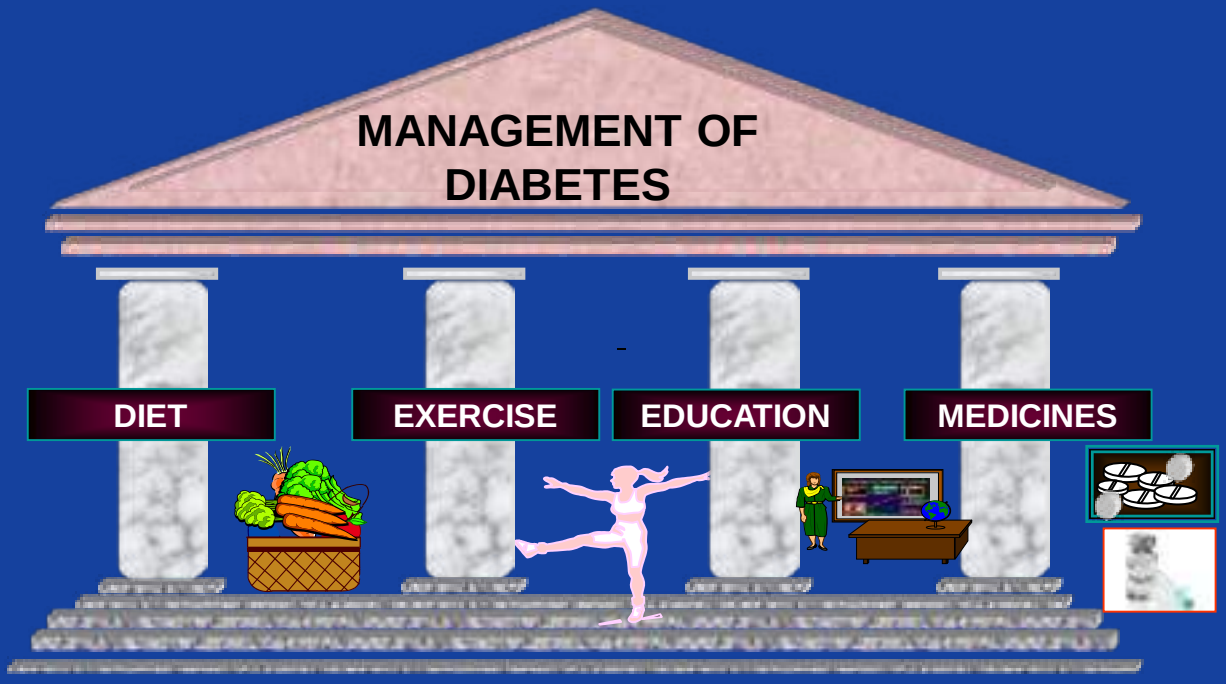
- In relieving stress and anxiety

- Develop a hobby
- Learn to relax
- Find inner peace
- Spirituality is the key

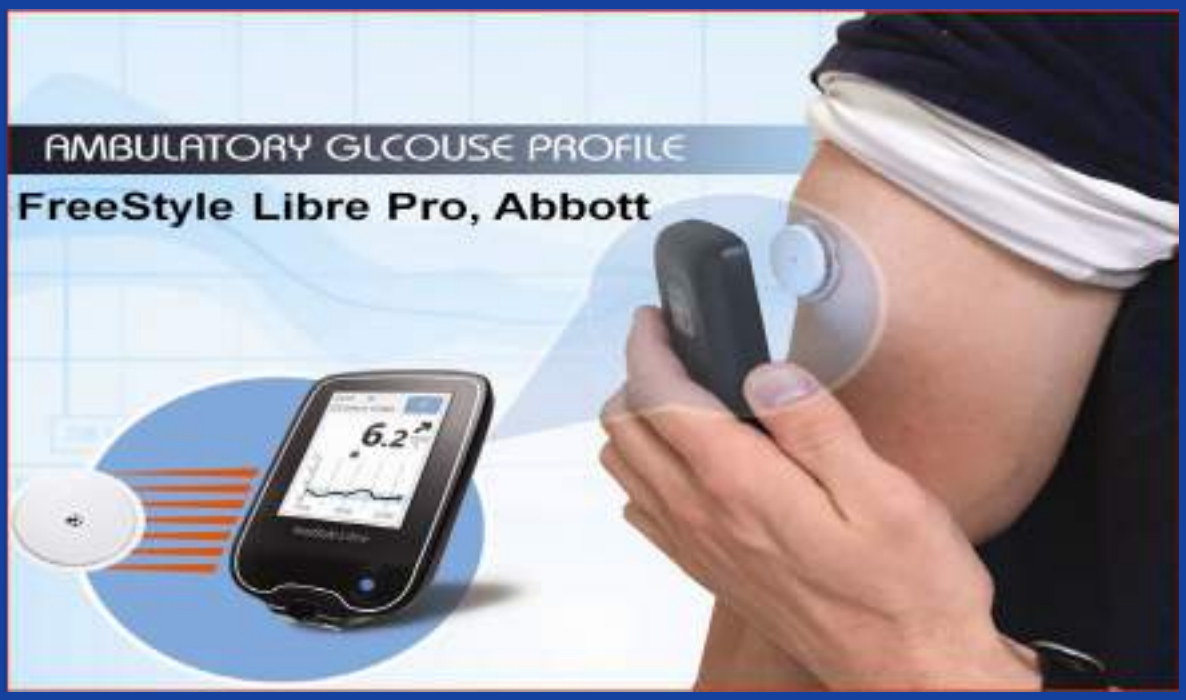
Five tips for improving immunity and healthy living

1. Diet - Eat healthy and nutritious food
2. Exercise regularly
3. Reduce stress and anxiety
4. Sleep well
5. Control chronic conditions like diabetes, hypertension, etc

MANAGEMENT OF DIABETES

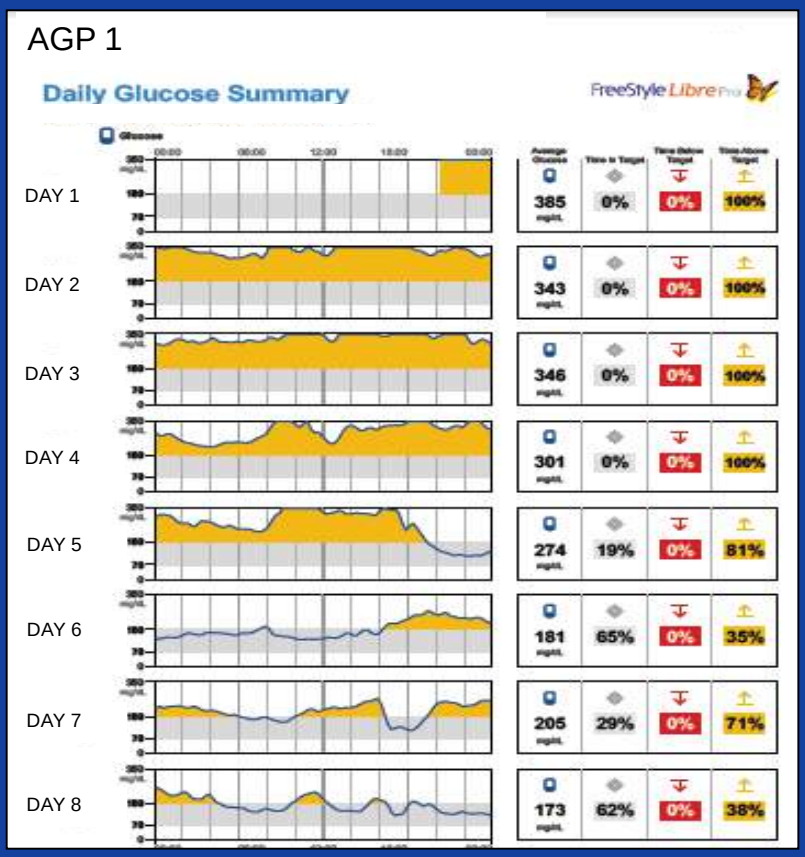


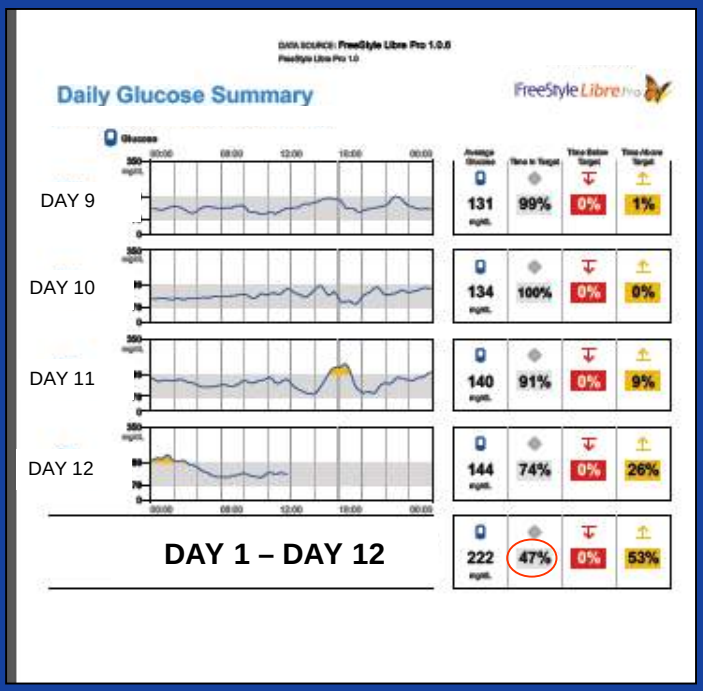
FreeStyle Libre Pro Flash Glucose Monitoring System

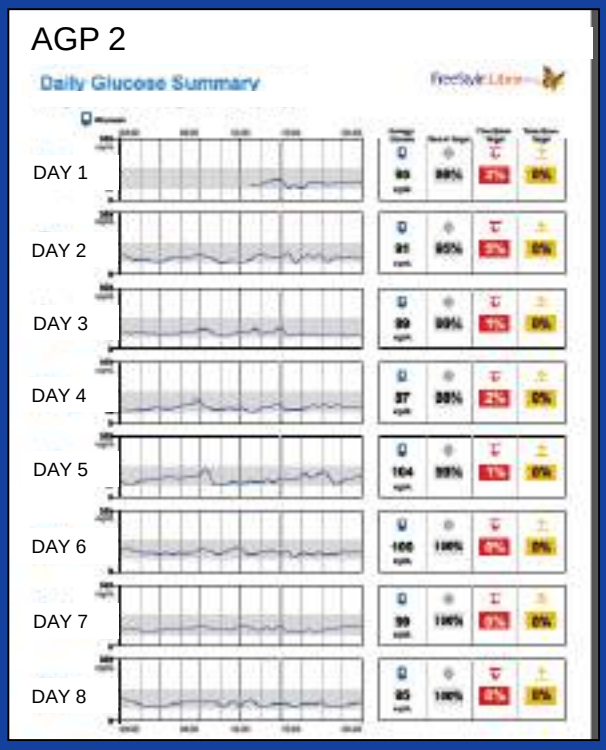


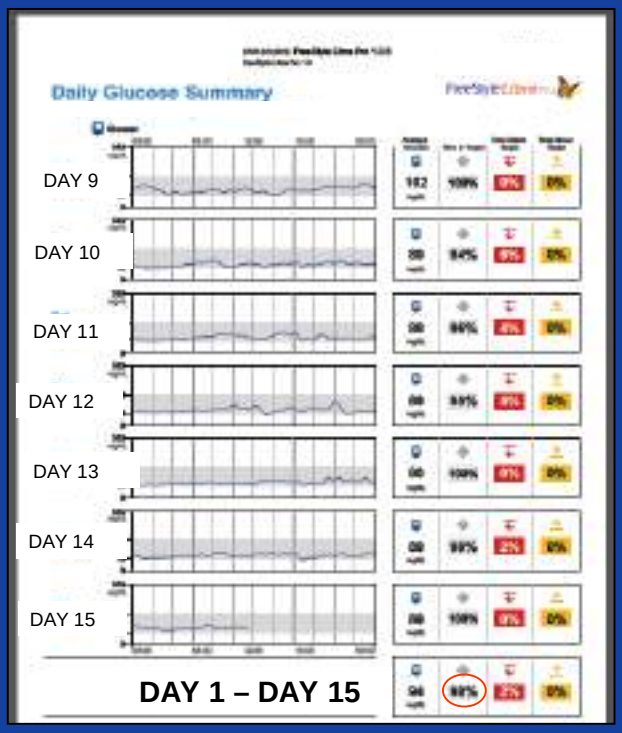
- Provides retrospective data up to 2 weeks period.
- Patient is blinded to the results till the 2 weeks period is over.
- However, they continue to do SMBG as usual.
- Differs from Freestyle Libre System used in Europe and elsewhere in that it is meant for use under HCP guidance.

AGP 1


Daily Glucose Summary
FreeStyle Libre Pro
DAY 1
385 0% 0% 100%
DAY 2
343 0% 0% 100%
DAY 3
346 0% 0% 100%
DAY 4
301 0% 0% 100%
DAY 5
274 19% 0% 81%
DAY 6
181 65% 0% 35%
DAY 7
205 29% 0% 71%
DAY 8
173 62% 0% 38%


Daily Glucose Summary
FreeStyle Libre Pro
DAY 9
131 99% 0% 1%
DAY 10
134 100% 0% 0%
DAY 11
140 91% 0% 9%
DAY 12
144 74% 0% 26%
DAY 1 – DAY 12
222 47% 0% 53%


AGP 2
Daily Glucose Summary
DAY 1
DAY 2
DAY 3
DAY 4
DAY 5
DAY 6
DAY 7
DAY 8


Daily Glucose Summary
DAY 9
DAY 10
DAY 11
DAY 12
DAY 13
DAY 14
DAY 15
DAY 1 – DAY 15

How do you assess diabetes control ?

- Fasting plasma glucose : 100 – 120 mg/dl
- Postprandial plasma glucose : 120 – 160 mg/dl
- HbA1c : < 7%
- Time in Range (TIR) : > 70%

UNCONTROLLED DIABETES CAN LEAD TO COMPLICATIONS

Coronary Artery Disease (CAD)	Peripheral Vascular Disease (PVD)	Retinopathy	Nephropathy (Microalbuminuria)	Neuropathy
				
Urban - 21.4% Rural – 10.8%	Urban - 6.3% Rural – 7.3%	Urban - 17.6% Rural – 18.2%	Urban - 26.9% Rural – 24.3%	Urban - 26.1% Rural – 30.9%
Millions (2020): 12	6	14	20	22

Mohan V et al, J Am Coll Cardiol. 38; 682-687, 2001; Premalatha G et al, Diabetes Care, 23: 1295-1300, 2000; Rema M et al, Invest Ophthalmol Vis Sci, 46: 2328-33, 2005; Ranjit Unnikrishnan I et al, Diabetes Care. 30:1527-23, 2007; Pradeepa, et al, Diabetic Medicine, 25: 407 – 412, 2008; Mohan V et al, Journal of Diabetes Science and Technology, 6:1355-1364, 2012

HENCE PREVENTION IS THE KEY

TAKE HOME MESSAGES

- We are living in unprecedented times.
- COVID – 19 has changed our lives may be forever.
- Right now, COVID – 19 seems to be on the decline in India but it is too early to relax.
- Everyone, should try to get vaccinated so that we can continue our lives as before.
- Meanwhile, healthy living with attention to diet, exercise and control of chronic conditions like diabetes and hypertension are essential.

TAKE CARE AND STAY SAFE

OUR PRESENCE IN SOCIAL MEDIA

Dr. Mohan's DIABETES SPECIALITIES CENTRE

www.facebook.com/drmohansdiabetesinstitutions

twitter.com/DMDSC

www.youtube.com/c/DrMohansDiabetesSpecialitiesCentre

https://www.instagram.com/drmohansindia/

https://www.linkedin.com/company/drmohans/

(Dr. V. Mohan Personal)

www.facebook.com/DrVMohanDiabetologist

twitter.com/drmohanv

www.youtube.com/drvmohan

www.instagram.com/drvmohan/

www.linkedin.com/in/dr-v-mohan-69805862/

Dr. Mohan's DIABETES SPECIALITIES CENTRE

Prevention & Control of Diabetes

Dr. S V Madhu the last speaker of the day spoke on prevention and control strategies for Diabetes with particular reference to the role of stress at workplaces. He noted that Diabetes constitutes a major health and economic burden in our country. Various studies throughout the world have shown that Type 2 diabetes can be prevented by lifestyle changes. We need to focus on prevention and develop cost-effective strategies for the prevention of Type 2 diabetes. In a study carried out in east Delhi, it was found that the prevalence of diabetes was close to 20% in the adult population and if you add the people with pre-diabetic stage then another 20% will be added. In other words, nearly 40 to 50% of the population is at risk of getting diabetes. Overall, in India, there is an excessive prevalence of abdominal obesity and general obesity, and both are risk factors across the country. Physical inactivity in the country is very common. A study conducted by Anjana et al found that 54% of the people were physically inactive. Subjects from the urban area are more inactive compared to people from rural areas. Women were found to be more inactive than men. Since the pre-diabetes period is a long one, this period can be the potentially effective stage for the intervention and reversal of diabetes. The screening tests can identify persons at high risk. Studies throughout the world and also in India have shown that lifestyle interventions particularly diet and exercise work very effectively in the prevention of diabetes. The conclusion of most of these studies has been that diabetes can be prevented and lifestyle interventions work better than drugs.

Healthy living refers to adopting a lifestyle that promotes physical and mental fitness and facilitates the prevention of lifestyle diseases. Healthy living is at the core of any effort to prevent and treat diabetes whether at an individual level or community level. There is evidence to show that initial lifestyle interventions are cost-effective. Healthy food choices with a most beneficial metabolic profile are provided by a high carbohydrate low fat and fiber-rich diet which have been shown to have a definite role in the prevention of diabetes. High carbohydrate diets are effective when large amounts of unrefined carbohydrates and fibers are included such as legumes and unprocessed vegetables and fruits. Fat intake should be in the form of monounsaturated fatty acids with a parallel decrease in saturated fatty acids and trans fatty acids. Brown rice should be preferred to polished rice. Sugar intake should be reduced to 10% of the total energy intake. There are challenges in the implementation of lifestyle modification for in the absence of parks and swimming pools, going for a walk or swimming is not possible. Depending on the available resources in the neighborhood and also its feasibility, one has to fine-tune one's physical activity.

Stress can both contribute to and be a consequence of diabetes. The evidence that stress can lead to diabetes came in the last 20 years. Chronic stress is a major public health problem and unless we address stress, we will not be able to prevent the lifestyle diseases completely. Stress is the body's non-specific response to changes and challenges in life. Anything that gives stress to an individual is called a stressor. In our day-to-day life, we come across so many stressors. When two people face the same stressor, one meets the challenge whereas the other doesn't. One who can meet the challenge of the stressor is successful and it doesn't get converted to tension or strain or the stress in the true

sense which affects his health. The other person who cannot cope with the stressor is the one who develops stress which results in chronic diseases including diabetes. Hence we should find a way to deal with stress or find ways to manage stress.

In the police forces, the strategy should be to implement the policy of strengthening and reinforcing physical activities and also spend time addressing the issues of work-related stress to prevent obesity and the risk for diabetes and pre-diabetes. The sum substance of the ICMR sponsored studies on Stress and type 2 diabetes have shown that chronic psychological stress is an important and significant factor that predicts the development of diabetes. Subjects experiencing more stressful life events with less coping ability to stress are at higher risk of developing obesity, insulin resistance, and diabetes mellitus. At an individual level, relaxation, meditation techniques, yoga, and aerobic exercises are a few ways by which one can reduce stress. Organizational level, for example in the Police forces inculcating healthy lifestyle promotions, is essential which includes runs/marathons physical activity programs or yoga sessions, or something built into their work schedules or maybe daily work schedules. Reward programs are also important.

Yoga is a traditional Indian practice and is very useful in stress management. Yoga postures and pranayama help in relieving stress. Short-term studies have confirmed the usefulness of yoga in diabetes. When adopted as a regular lifestyle, Yoga can prevent diabetes. Yoga appears to be a suitable cost-effective alternative to supplement lifestyle intervention programs that are close to the population. The Indian Preventive Diabetic Study, a multicentre randomized controlled trial of Yoga and Fenugreek is near completion. The study is trying to look at a prevention program for diabetes. Yoga and Fenugreek are indigenous, easily implementable cost-effective and if shown to wok, can be a major health strategy to prevent diabetes at a community level. Dr. Madhu concluded by emphasizing healthy living which includes, consuming a healthy and balanced diet, being physically active, ensuring adequate sleep, having minimum stress in life, avoiding smoking and chewing tobacco and alcohol, and brushing our teeth regularly. Healthy living can effectively reduce diabetes both at the community and at the individual level and could be a focus of all preventive strategies. Healthy living for all is the key to containing the diabetic epidemic in our country.

During the question and answer session, Shri B. S. Jaiswal wanted to know the relevance of diabetes on brushing one's teeth apart from oral health. Dr. Madhu clarified that there were several links between bad teeth and bad gums and diabetes. It is well known that diabetes can cause chronic inflammation of the gums and the reverse has also been shown.

Prevention and Control strategies for Diabetes with particular reference to role of stress at work-place

Prof.S.V.Madhu

Head, Dept. of Endocrinology &

Head, Centre for Diabetes, Endocrinology & Metabolism

University College of Medical Sciences – GTB Hospital, Delhi , India

Past President,Endocrine Society of India

Past President , Research Society for Study Of Diabetes in India

Prevention of Type 2 Diabetes Mellitus

* Diabetes constitutes a major health & economic burden in our country
* Focus has to be on Prevention
* Wealth of studies in several populations showing that type 2 diabetes can be prevented
* There is an urgent need for developing simple and cost effective strategies for the prevention of T2 DM

Prevalence of Diabetes and Prediabetes in India

- 62.4 million people have diabetes in India
- 77.2 million people have prediabetes in India
- Prevalence varied from 5.3% in the East to 13.6% in the North

Anjana RM, Pradeepa R, Deepa M, Datta M, Sudha V, Unnikrishnan R, Bhansali A,

Joshi SR, Joshi PP, Yajnik CS, Dhandhania VK, Nath LM, Das AK, Rao PV, **Madhu SV**,

Shukla DK, Kaur T, Priya M, Nirmal E, Parvathi SJ, Subhashini S, Subashini R,

Ali MK, Mohan V. *ICMR–INDIAB Collaborative Study Group.*

Diabetologia 2011; 54: 3022-27.

Diabetes & Metabolic Syndrome: Clinical Research & Reviews 12 (2018) 923–927

Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

Original Article

High prevalence of diabetes, prediabetes and obesity among residents of East Delhi - The Delhi urban diabetes survey (DUDS)

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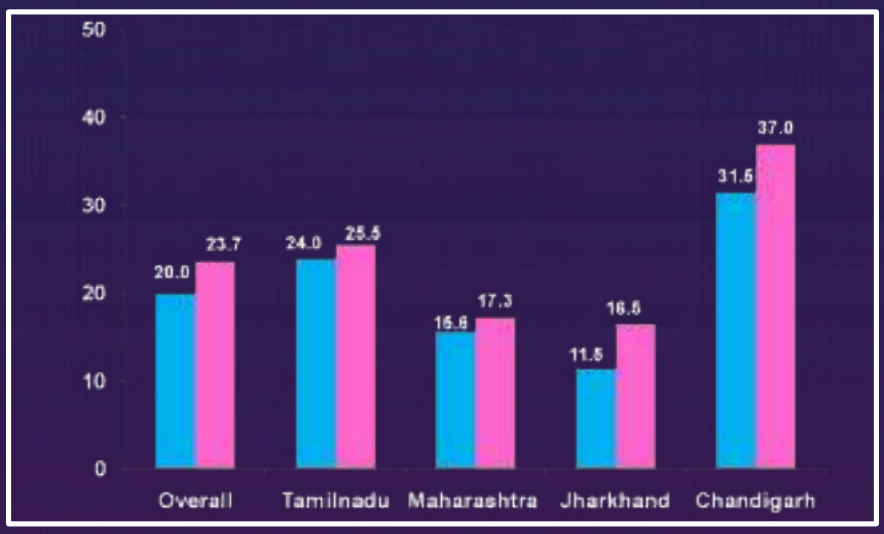
ARTICLE INFO

Keywords:
Diabetes
DUDS
Obesity
Prediabetes
Prevalence

ABSTRACT

Aim: The burden of diabetes is very high in our country particularly in the urban metros. The present survey was planned to ascertain the current prevalence of diabetes and prediabetes in Delhi since the available prevalence estimates are over a decade old.
Methods: The present study was conducted in urban area of east Delhi and followed a multistage random sampling design. The prevalence of known diabetes was ascertained based on self reporting and prevalence of newly detected diabetes and prediabetes was based on oral glucose tolerance test (OGTT).
Results: We surveyed 470 households and included 1317 individuals. Prevalence of diabetes was 18.3% (known 10.8% and newly detected 7.5%). Prevalence of prediabetes was 21% as per WHO criteria and 39.5% as per ADA criteria. The ratio of known to unknown diabetes was 1.44:1. Every third household (35.77%) had at least one known case of diabetes. High rates of obesity and central obesity were also observed in the study population.
Conclusion: The present study found a strikingly high prevalence of diabetes, prediabetes and obesity in Delhi. This calls for urgent and effective preventive measures to prevent diabetes.

Prevalence of Generalised and Abdominal obesity in India



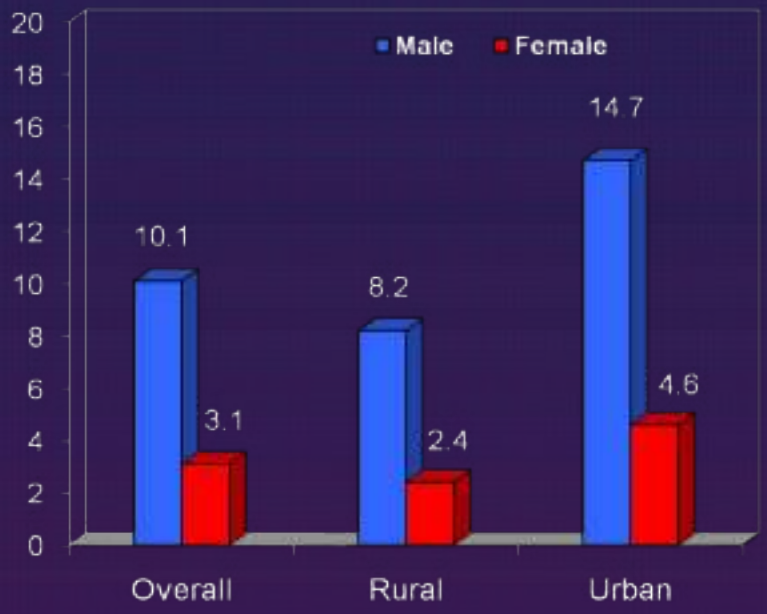
Generalized obesity (BMI ≥ 25 kgm^{-2});

Abdominal obesity (WC ≥ 90cm in men and ≥ 80cm in women);

Prevalence of Abdominal Obesity as well as of Generalised Obesity were high in India

Pradeepa R, Anjana RM, Joshi SR, Bhansali A, Deepa M, Joshi PP, Dhanania VK, **Madhu SV**, Rao PV, Geetha L, Subashini R, Unnikrishnan R, Shukla DK,Kaur T, Mohan V[1], Das AK;
ICMR-INDIAB Collaborative Study Group.
Indian J Med Res 2015 Aug;142(2):139-50.

Physical activity and inactivity patterns in India ICMR-INDIAB study



- Of the 14227 individuals studied, 54.4% were inactive
- Subjects from urban areas more inactive compared to rural areas (65.0% vs. 50.0%
- Women more inactive than men

Anjana RM, Pradeepa R, Das AK, Deepa M, Bhansali A, Joshi SR, Joshi PP, Dhandhania VK, Rao PV, Sudha V, Subashini R, Unnikrishnan R, **Madhu SV**, Kaur T, Mohan V, Shukla DK; ICMR– INDIAB Collaborative Study Group.
Int J Behav Nutr Phys Act. 2014 Feb 26;11(1):26. doi: 10.1186/1479-5868-11-26.

Feasibility of prevention

- Prevention of type 2 DM should be feasible since:
  - Long asymptomatic period that precedes development of the disease - Prediabetes
  - Screening tests can identify persons at high risk
  - Safe, potentially effective interventions for the modifiable risk factors
  - Observational studies and clinical trials of lifestyle change

The Science for Type 2 Prevention: Major Studies

Study	Site
Da Qing IGT and Diabetes Study	China
Diabetes Prevention Study	Finland
Diabetes Prevention Program	USA
STOP NIDDM	Europe/Canada
TRIPOD	USA
XENDOS	Europe/USA
Indian Diabetes Prevention Prog	India
DREAM	Multicountry
Healthy Study	USA
D CLIP	India

Conclusions

* Wealth of studies in several populations showing that type 2 diabetes can be prevented
* **Lifestyle intervention works better than drugs**
* Many challenges to implementation
* Lifestyle interventions are resource-intensive
* Is there a public health solution?

Healthy Living and Diabetes

* Healthy Living refers to adopting a lifestyle that promotes physical and mental fitness and facilitates prevention of lifestyle related diseases.

* Healthy living is at the core of any effort to prevent or treat diabetes , whether at the individual level or the community level.

Healthy Living and Diabetes

* Enough evidence that lifestyle interventions are effective in the prevention and management of type diabetes
* Hence all guidelines have recommended healthy lifestyle interventions uniformly in diabetes and prediabetes.
* Evidence from literature also suggests that initial lifestyle interventions are cost-effective
* Can significantly reduce the incidence of diabetes in Asian Indians with IGT or with combined IGT + IFG
* Lifestyle intervention with diet and exercise in those with IGT provide long-term beneficial effects for up to 20 years

Dietary Interventions

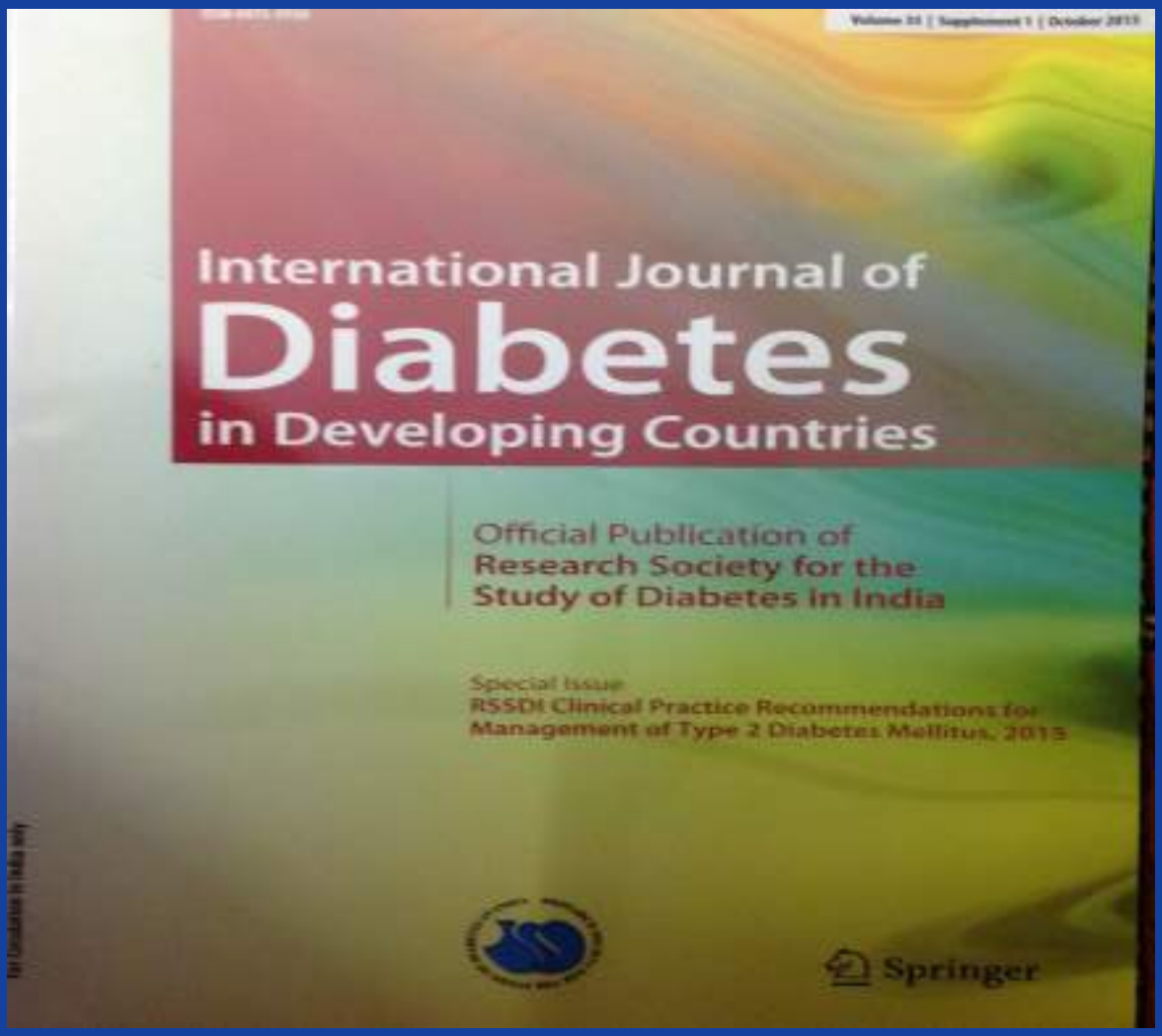
* Reduce Calories
* Reduce Saturated Fat
* Increase Whole Grain
* Increase Fruits and Vegetables
* Eat Fish one –two times per week
* Use MUFA or PUFA oils
  * Olive, Canola, Peanut
  * Sunflower, safflower, Sesame,Corn or soy

Importance of Physical Activity

* A significant percentage of people report no regular physical activity

Physical Activity:

* Decreases body weight and body fat
* Improve sense of well-being
* Reduces functional decline with aging
* Improves lipid profile, lower blood pressure, decrease risk for blood clots


International Journal of
Diabetes
in Developing Countries
Official Publication of
Research Society for the
Study of Diabetes in India
Special Issue
RSSDI Clinical Practice Recommendations for
Management of Type 2 Diabetes Mellitus, 2015
Springer

Healthy Living and Diabetes

* People with prediabetes should modify their lifestyle including:
  * Lose 5 to 10%of body weight if overweight or obese
  * Participate in moderate physical activity (e.g. walking) for at least 150 mins/week
  * 6-8 hrs. of sleep daily
* Healthy lifestyle measures including diet and physical activity are equally important for non-obese patients with T2DM also

Healthy Physical Activity

* A total of 60 min of physical activity is recommended every day for healthy Indians in view of the high predisposition to develop T2DM and CAD.
* This can include at least
  * 30 min of moderate-intensity aerobic activity,
  * 15 min of work-related activity and
  * 15 min of muscle-strengthening exercises (at least 3 times / week).

Healthy Food Choices

* Healthy food choices with the most beneficial metabolic profile is provided by a high-carbohydrate low-fat and fiber-rich diet which have been found to have a definite role in prevention of diabetes.
* High-carbohydrate diets are effective when relatively large amounts of unrefined carbohydrate and fiber are included such as legumes, unprocessed vegetables and fruits.

Healthy Food Choices

* Other food choices:
  * Fat intake should occur mainly in the form of monounsaturated fatty acids (MUFA) with a parallel decrease in saturated fatty acids(SFAs) and trans fatty acids(TFAs).
  * Particularly beneficial in patients with impaired glucose tolerance, diabetes and obesity
  * Brown rice is preferred to polished white rice.
  * It is also recommended that intake of sugar be restricted to less than 10% of total daily energy intake
  * Combining foods with high and low glycemic indices, such as adding fiber-rich foods to a meal or snack can also help improve glycemic and lipaemic profiles.

Healthy Sleep

* Optimal sleep (7–8 hours per night) has been shown to maintain metabolic health, aid in weight loss and increase insulin sensitivity
* Short-duration (< 5-6 hrs.) or longer-duration (> 8-9 hrs.) of sleep was associated with increased risk of diabetes.
* **It is recommended that all individuals including those with prediabetes and diabetes should have 6-8 hrs. of sleep daily.**

Challenges in implementing LSM

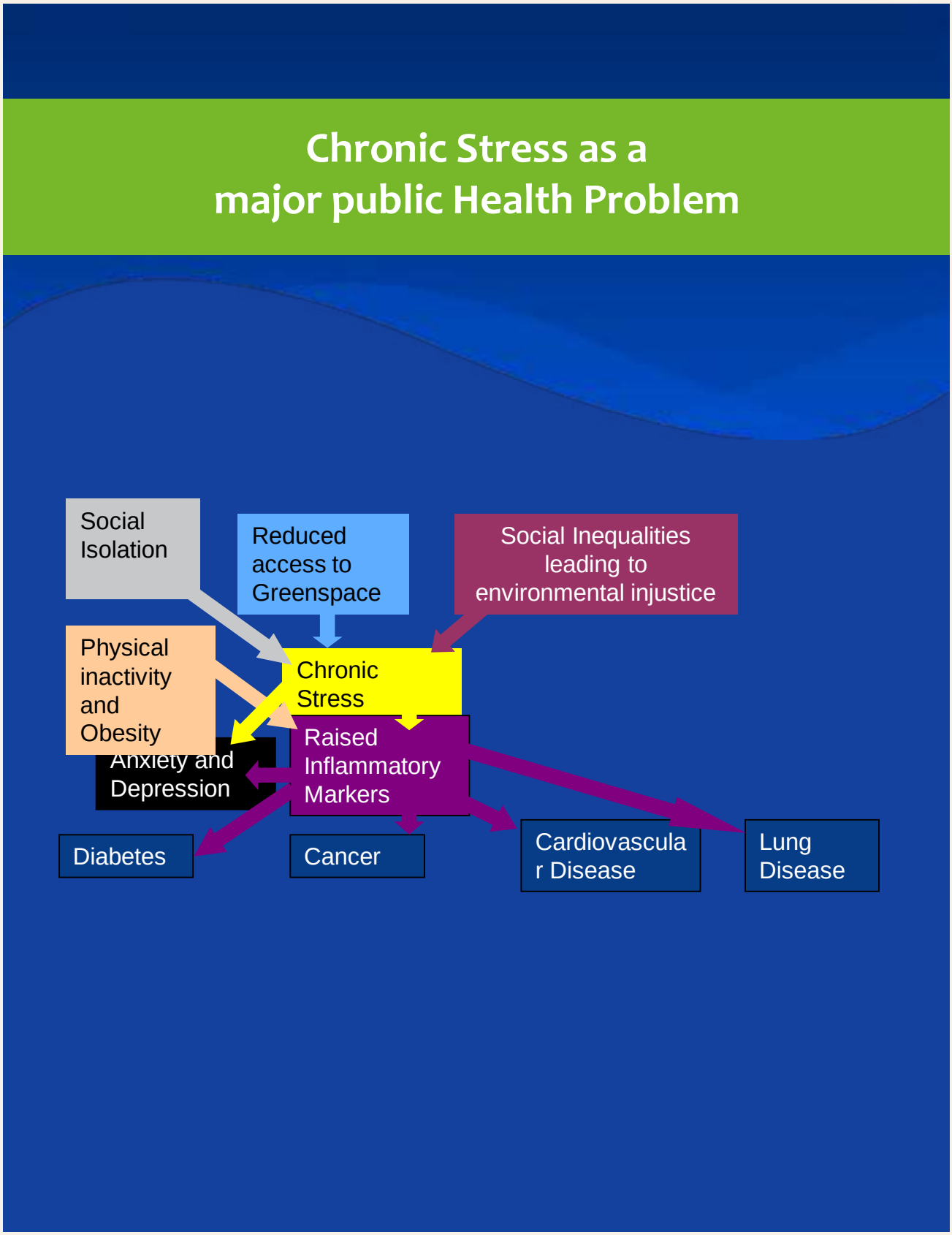
* One of the major challenges of Lifestyle modification is that it can be difficult to achieve and maintain in the long-term once initial changes have been made.
* Many of the healthy eating and healthy physical activity interventions have been shown to be successful only in clinical trial settings
    * with labour intensive protocols involving constant reinforcement through multiple encounters on a continued basis .
* **The real challenge is to translate this evidence to the real life situation with all financial and human resource limitations**

Stress and Diabetes – A 2 way Link

* Diabetes leads to stress
* Stress can also lead to development of Diabetes

Stress and Development of Diabetes

* Stress is an important and critical factor associated with urbanisation and could play a major role in the causation of type 2 diabetes mellitus
* Stress is believed to be associated with the causation of diabetes, although no clear direct link has been demonstrated till recently
* Earlier experimental as well as human studies have suggested a role of stress in the causation of diabetes
* However, direct evidence demonstrating that stress plays a clinically significant role in the expression of human diabetes has come only recently


Chronic Stress as a major public Health Problem
Social Isolation
Reduced access to Greenspace
Social Inequalities leading to environmental injustice
Physical inactivity and Obesity
Chronic Stress
Anxiety and Depression
Raised Inflammatory Markers
Diabetes
Cancer
Cardiovascular Disease
Lung Disease

What is Stress?

Stress is a nonspecific response of the body to a demand made upon it.

It is the mental and physical response of our bodies to the changes and challenges in our lives

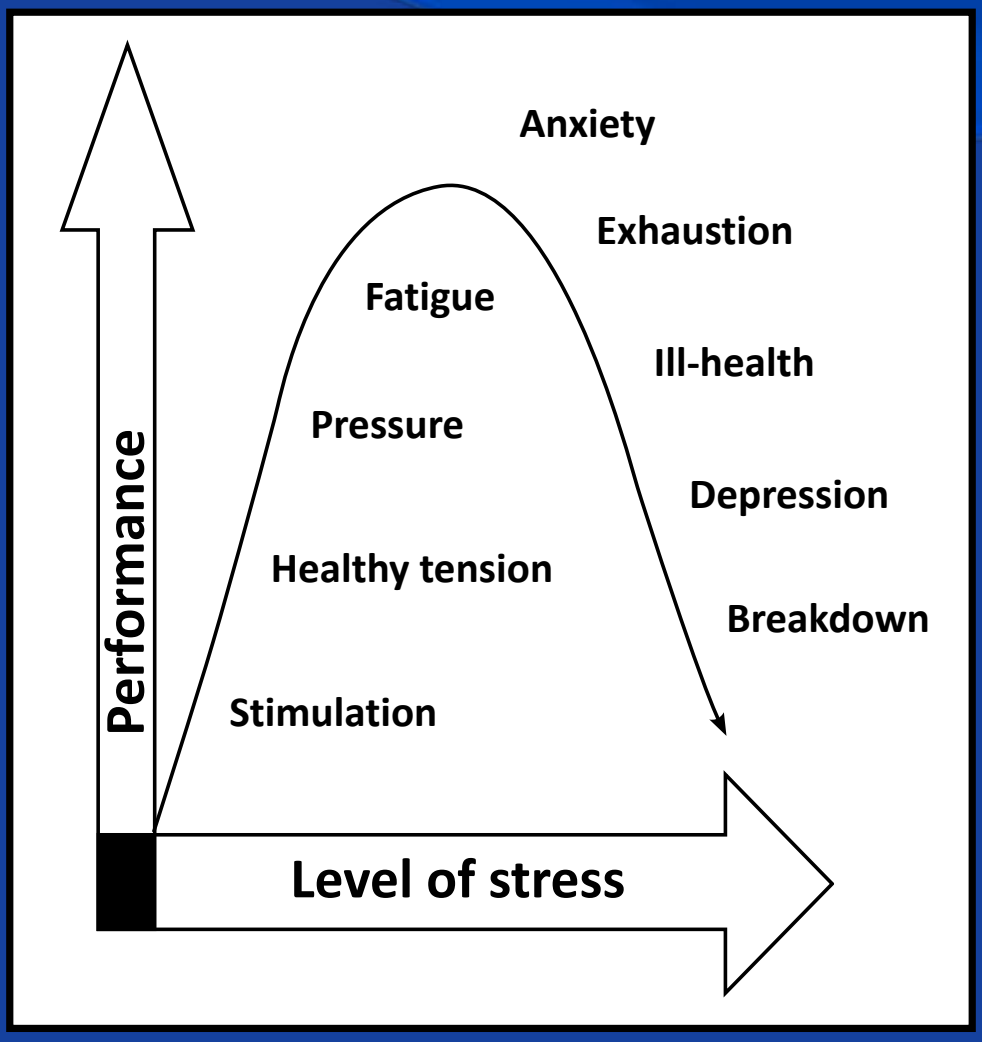
Stressors

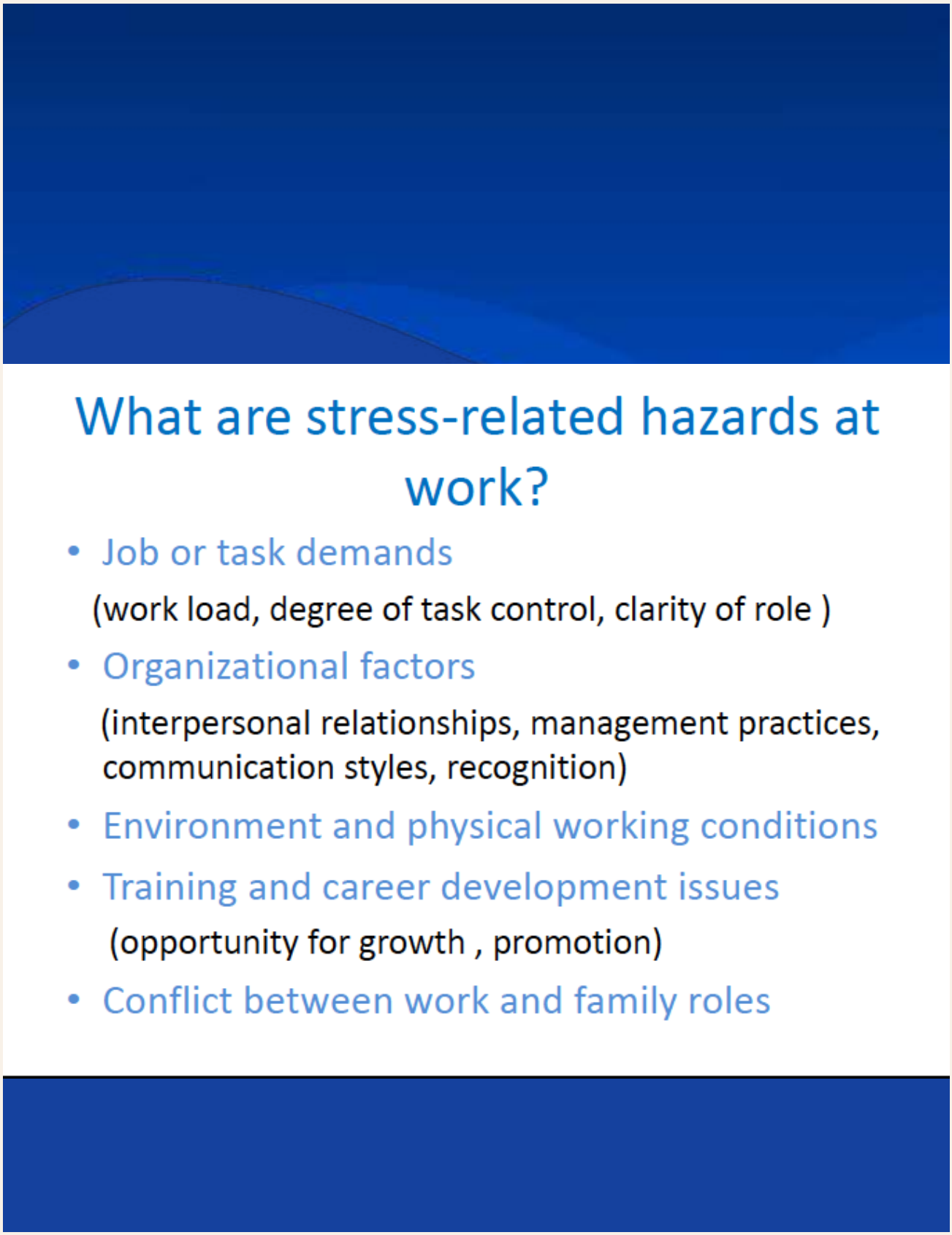
* Stressor: characteristic that introduces entropy into the system; life experience characterized by inconsistency, under- or overload, & exclusion from decision making
* Chronic: Enduring, permanent, generalized phenomenon; primary determinant of SOC
* Major life events: Specifiable in time & space; Strength of SOC → outcome is noxious, neutral or salutary
* Daily hassles: No automatic adaptive response, but no impact on SOC or health status

Tension management

* 2 people confronted by same stressor, one meets challenge & other doesn't
* *Tension*: strain incurred by exposure to stressor
* *Stress*: reserved for the strain that remains when tension is not successfully overcome
* *Tension management*: process of dealing with this tension

Occupational Stress

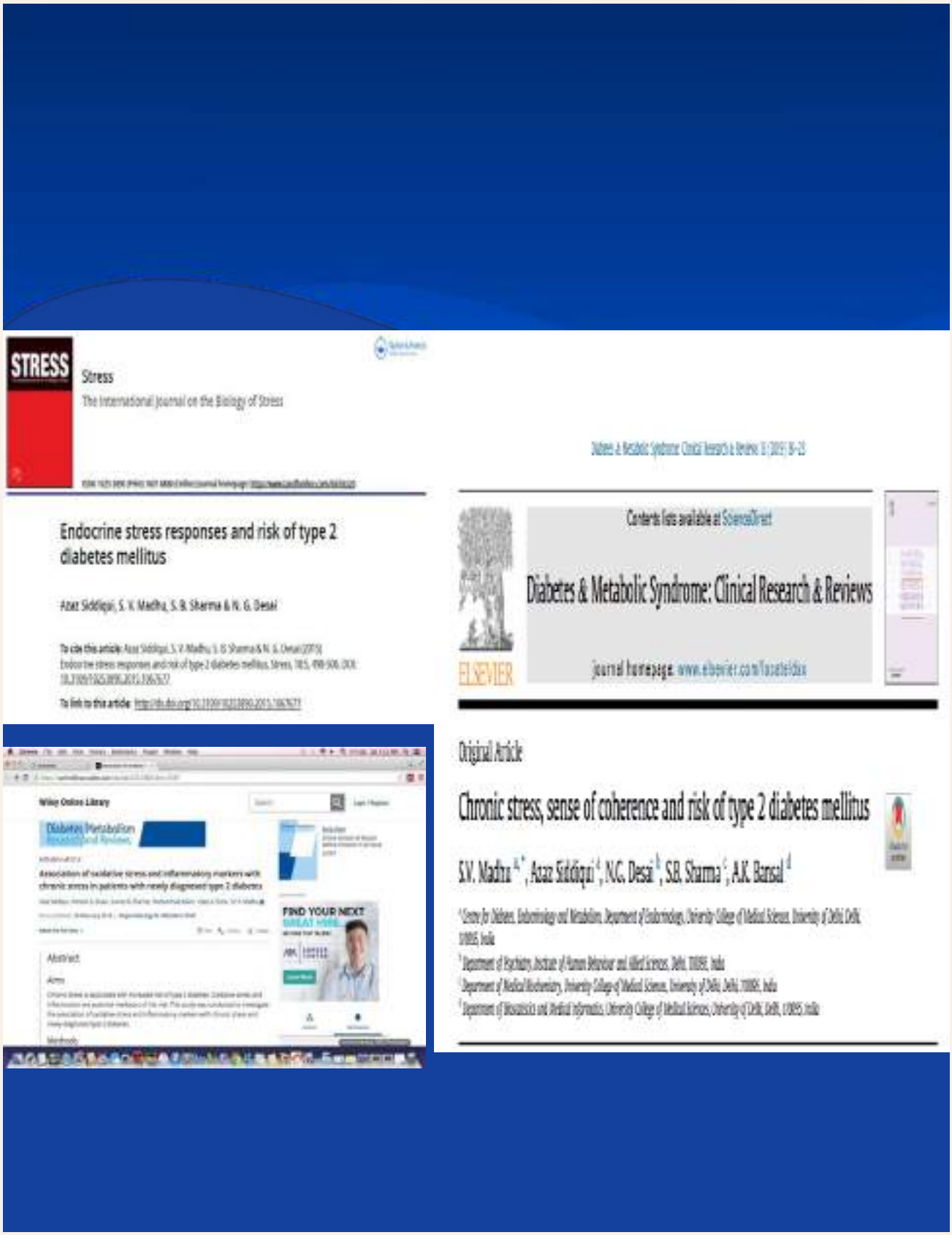



What are stress-related hazards at work?
• Job or task demands
(work load, degree of task control, clarity of role)
• Organizational factors
(interpersonal relationships, management practices, communication styles, recognition)
• Environment and physical working conditions
• Training and career development issues
(opportunity for growth , promotion)
• Conflict between work and family roles


Roles
Nurses
Work overload
Understaffing
Time pressure
Lack of support from supervisors, head nurses, higher management
Exposure to infectious diseases
Needle stick injuries
Dealing with difficult, seriously ill, violent
Career development issues
Doctors
Long hours
Sleep deprivation
Excessive workload
Dealing with death and dying
Interpersonal conflicts with other staff
Patient expectations
Threat of litigation
Interpersonal conflicts (patients, colleagues)
Career development issues

Coping with stress

* Coping involves efforts to change circumstances, or your interpretation of circumstances,
  * To make them more favorable and less threatening
* Coping tends to be a dynamic, ongoing process
* When coping is effective, we adapt to the situation, and stress is reduced


STRESS
Stress
The international journal on the Biology of Stress
Endocrine stress responses and risk of type 2 diabetes mellitus
Azaz Siddiqui, S. V. Madhu, S. B. Sharma & N. G. Desai
Diabetes & Metabolic Syndrome: Clinical Research & Reviews
journal homepage: www.elsevier.com/locate/dsx
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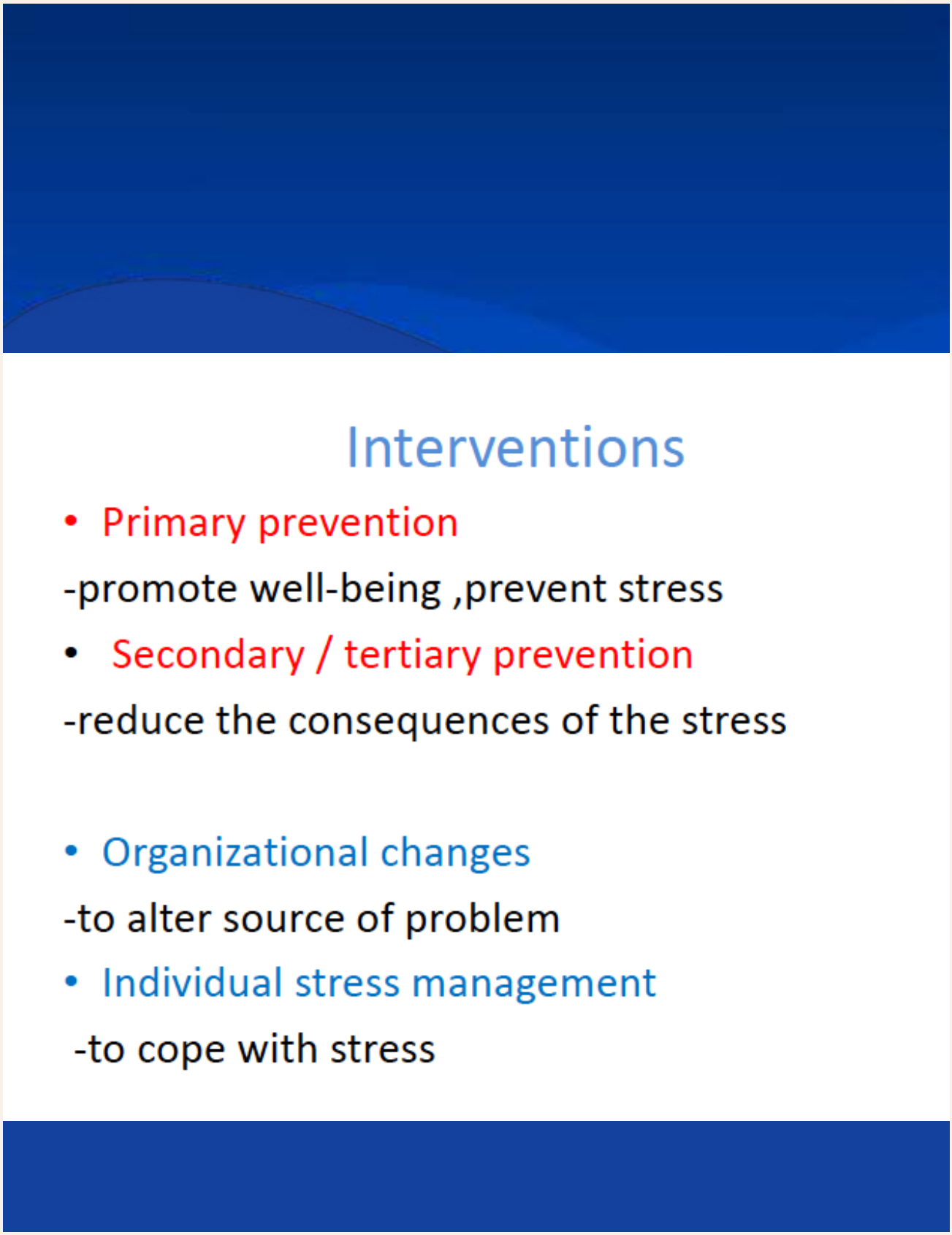
Original Article
Chronic stress, sense of coherence and risk of type 2 diabetes mellitus
S.V. Madhu, Azaz Siddiqui, N.G. Desai, S.B. Sharma, A.K. Bansal

Stress, stress coping and Development of Diabetes

* ***The main findings of these studies were:***
  * Chronic psychological stress is an important & significant risk factor that predicts the development of diabetes.
  * Subjects experiencing more stressful life events or major changes in their life and **with less coping ability to stress** are at higher risk of developing obesity, insulin resistance and diabetes mellitus


Interventions
• Primary prevention
-promote well-being ,prevent stress
• Secondary / tertiary prevention
-reduce the consequences of the stress
• Organizational changes
-to alter source of problem
• Individual stress management
-to cope with stress

Primary prevention:

Individual level

-Target physical concomitants of stress

:relaxation, meditation techniques

,yoga, aerobic exercises

Primary prevention :

Individual—organizational interface level

-Healthy lifestyle promotion

-Staff appraisal/
reward programme

Stress Management- Role of Yoga

- Traditional Indian Practice
- Lifestyle form with benefits in relieving stress and disease
  - Yoga Postures and Pranayam
- Short term studies have confirmed usefulness in Diabetes
- When adopted as a regular lifestyle can help in prevention of Diabetes

Yoga for prevention of Diabetes

* There is also a need for effective stress relieving approaches as part of an overall strategy of healthy living if we are to effectively contain the problem of diabetes and its complications.
* In view of the resource constraints and diversity in lifestyles among Indian population
  * **yoga appears to be a suitable cost effective alternative to supplement to lifestyle intervention programs that are close to population.**
* Yogic practices can be combined with other forms of physical activity

Role of Yoga

* ***Yoga*** has been known for long to be useful in several lifestyle diseases including diabetes mellitus
  * Preliminary evidence suggests that Yoga has a favourable effect on glycaemia, insulin resistance & lipid profile
  * Several yoga asanas have been reported to have beneficial effects in control of glycaemia in diabetic subjects
  * **Long term follow up** of type 2 diabetes subjects also confirmed the efficacy of yoga in this condition
  * There have also been reports suggesting that yoga could be an effective strategy for long term prevention of type 2 DM

Lifestyle Management – YOGA RSSDI

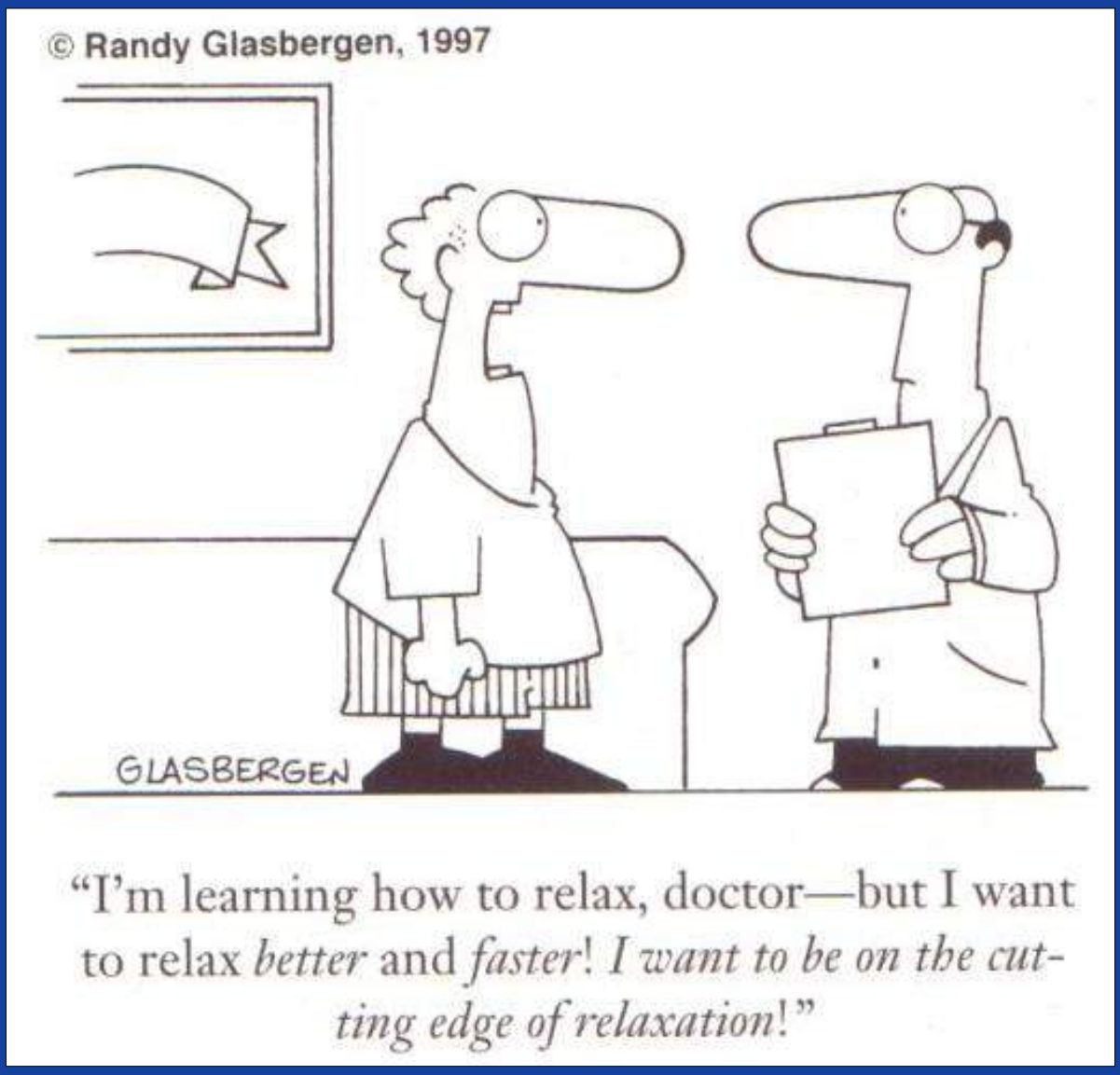
* Yogic practices lead to improvement in glycemic control, reduction in BP, Correction of dyslipidemia, Reduction of insulin resistance and correction of hyperinsulinemia, with elimination of stress
* Yogic practices can be combined with other forms of physical activity when it should be done for 30 min every day while for those individuals not having other forms of physical activity, it is recommended that yogic practices are carried out for 45-60 min to achieve the metabolic benefits

A Multicentric, Randomized, Controlled trial of Yoga and Fenugreek in prevention of type 2 diabetes mellitus – The Indian Prevention of Diabetes Study (IPDS)

Research Society for the study of Diabetes in India

Coordinating center :
Prof S.V.Madhu, UCMS Delhi ,
Other centres:
Mumbai, Hyderabad, Bangalore and Puduchery
Jaipur,Kochi

Yoga for those at risk for Diabetes at DEM centre



"I'm learning how to relax, doctor—but I want to relax *better* and *faster*! *I want to be on the cutting edge of relaxation*!"

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Editorial

World Diabetes Day 2015: Healthy living & diabetes

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Healthy Living and Diabetes

* Healthy living includes:
  * consuming a healthy and balanced diet,
  * being physically active,
  * ensuring adequate sleep,
  * minimizing stress in our lives
  * avoiding smoking, tobacco chewing and alcohol
  * brushing our teeth regularly

Healthy Living and Diabetes

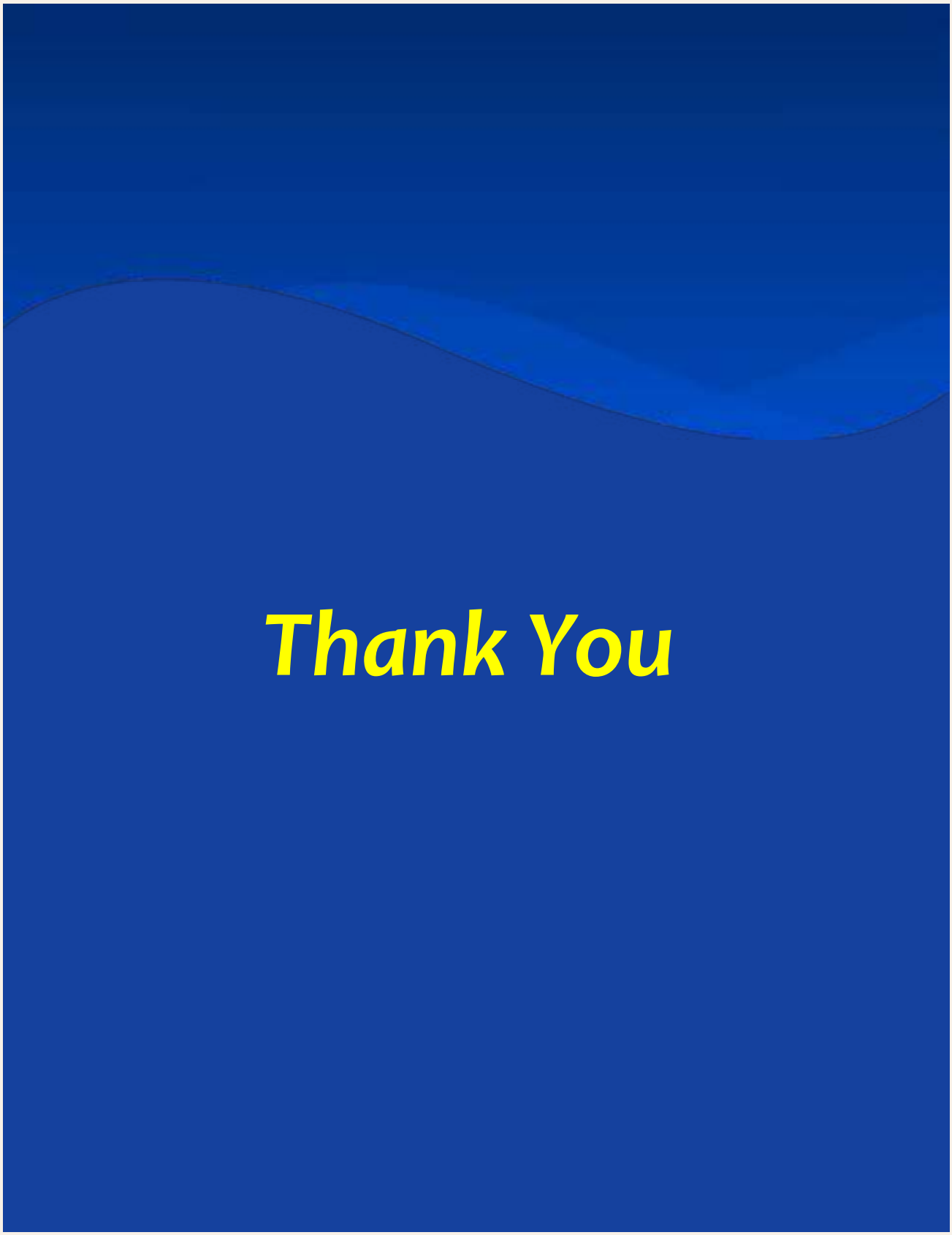
* At a community level
  * Can effectively reduce the burden of Diabetes and its complications.
  * The focus of all preventive strategies should be on healthy lifestyle interventions.
* At the level of the individual
  * Helps prevent diabetes in those at risk
  * Facilitates good glycaemic control in those who are already diabetic.

Healthy Living and Diabetes

* There is an urgent need of promoting healthy living universally as an aggressive primary prevention strategy for diabetes and all other lifestyle related diseases instead of waiting for identifying a high risk individual to act.
* ***Healthy living for all is the key to containing the diabetes epidemic in our country.***

THE FAMOUS SERENITY PRAYER:

"Grant me the serenity to accept the things I cannot change, the courage to change the things I can, and the wisdom to know the difference."


Thank You

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