in support of

world diabetes day
14 November

DIABETES CONCERNS EVERY FAMILY

MESSAGE

Dear Doctor

Namaste! On behalf of Apollo, I salute you for being a key part of the crusade against Diabetes. The hard work with which you serve patients in the community is admirable. Apollo Sugar and the Clinical Excellence at Apollo Sugar Foundation are Apollo Hospital's commitment to build a high quality network of centres of excellence to treat diabetes, its complications, and related co-morbidities, and to help improve training and capacitation across the country. Our mission is to help every diabetic lead a disease free life and touch the lives of one million diabetic patients by 2020. With evidence based clinical protocols, robust lifestyle management, and patient friendly technology, we are delivering excellent clinical outcomes that help patients achieve and sustain control. We are also developing collaborative models like Partners of Sugar to bring our capabilities to your neighbourhood clinic to jointly serve and benefit maximal lives. We all know the numbers – too many diabetic lives growing at alarming rates, and not enough doctors, dieticians, nurses to help them. On this World Diabetes Day, let's renew our commitment to collaborate, to serve more lives and achieve a disease free lifestyle for all Diabetic patients and their families.

Warm Regards,

Ms. Sangita Reddy, Jt. MD, Apollo Hospitals Group

Dear Colleagues

Namaste! On behalf of Apollo on this occasion of WDD, I salute all the doctors, dieticians, nurses and broad medical fraternity that are working tirelessly in the crusade against diabetes. With your support, Apollo Sugar is growing from strength to strength. We now serve about 2,00,000 patients annually at 41 centres of excellence with world class diabetes and endocrine care. Our community surveillance and screening programs have touched the lives of 5,00,000 citizens and reflect our continual commitment to detect and treat early. The evidence based, patient centric model that we have together built grows stronger everyday

Our publications at international and national forums like ADA, AACE, IDF, RSSDI and ESICON is testimony that we are in this Clinical Excellence at Apollo Sugar. The best testimony that I see every single day is the smile of our patient and their caregiver, when with you and your care team's help they achieve and sustain BG control. While we have achieved a fair bit, in Robert Frost's famous words, we do have miles to go before we sleep! We have a lot ahead to continually improve our model, our network, and our work in the community to achieve our mission of a disease free lifestyle and serve one million diabetics by 2020. I am grateful for such a great team of clinicians and staff that demonstrate huge commitment to our cause every day. While we have our work cut out for us, I am confident that this team will do everything we can to serve patients, collaborate across the ecosystem and achieve our mission.

Warm Regards.

Mr. Gagan Bhalla, CEO, Apollo Sugar Clinics

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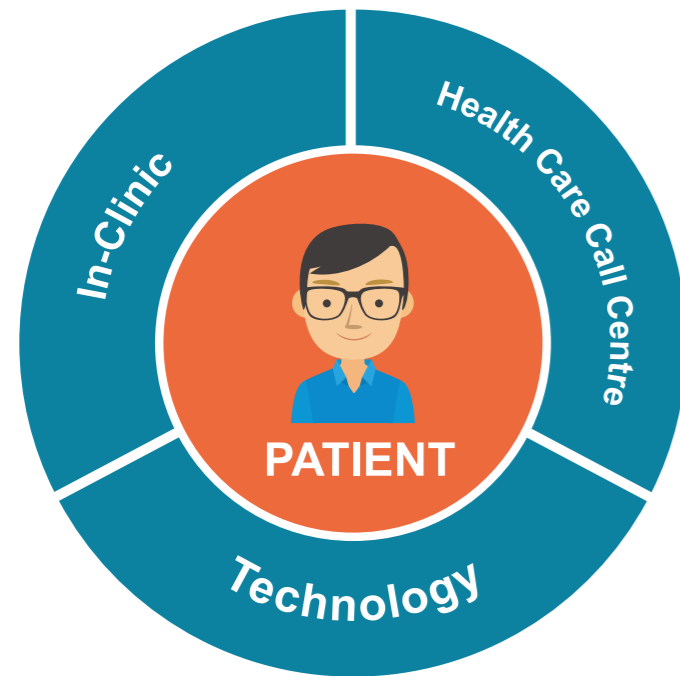

Dr. Ravi Sankar Erukulapati
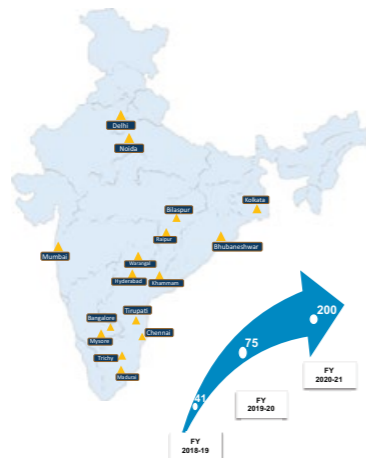

Dr. Usha Ayyagari

Dr. N.K.Narayanan

Dr. Aftab Ahmed

Dr. J.Jayaprakashsai

Contents

PATIENT

In-Clinic

Health Care Call Centre

Technology

FY 2018-19
FY 2019-20
FY 2020-21
200
75

OUR HOLISTIC APPROACH TO DIABETES CARE

At Apollo Sugar Clinics, we understand the hurdles diabetes poses to the patients. To help manage diabetes in the best possible manner, we have come up with a holistic approach towards diabetes treatment in the clinic, at home, or anywhere!
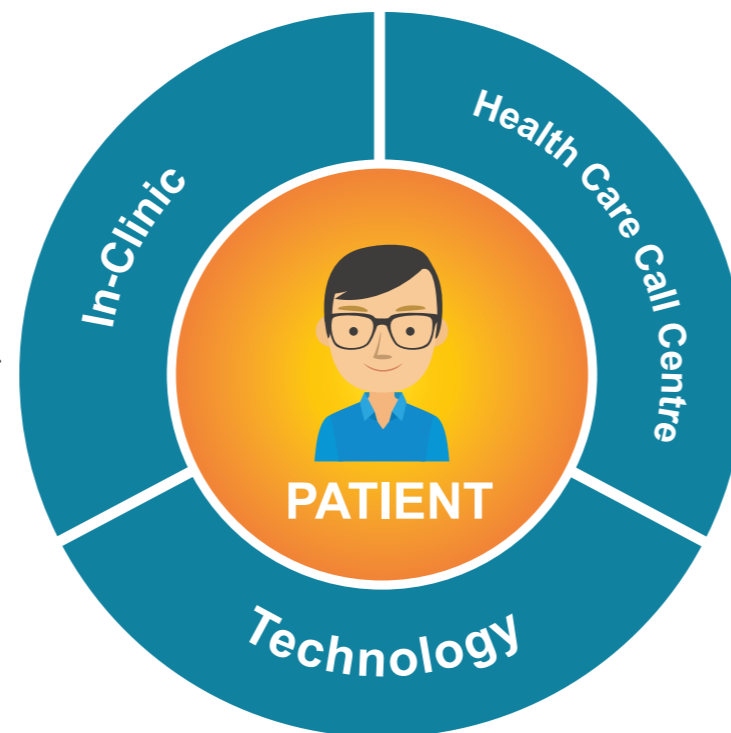
S — **Self - discipline** achieved by Sugar education and Awareness

M — **Monitoring and Medication :** SMBG, Acceptance and Compliance

A — **Adherence :** Diet, exercise and life style modification

R — **Rx compliance** and regular Blood Glucose monitoring

T — **Technology & Training :** Constant connect, 2-way engagement, and training

In-Clinic • Health Care Call Centre • Technology

PATIENT

In-Clinic Solutions

- Screening for Diabetes Complications- DEAR app
- Doctor Consultations.
- Multiple Diagnostics.
- Electronic Medical Records & Patient Demographics.
- Diet & Lifestyle Management from expert dieticians
- Diabetes Education & Awareness.

Beyond the Clinic Solutions

Technology
- Apollo Sugar App with personalised health coach to each patient.
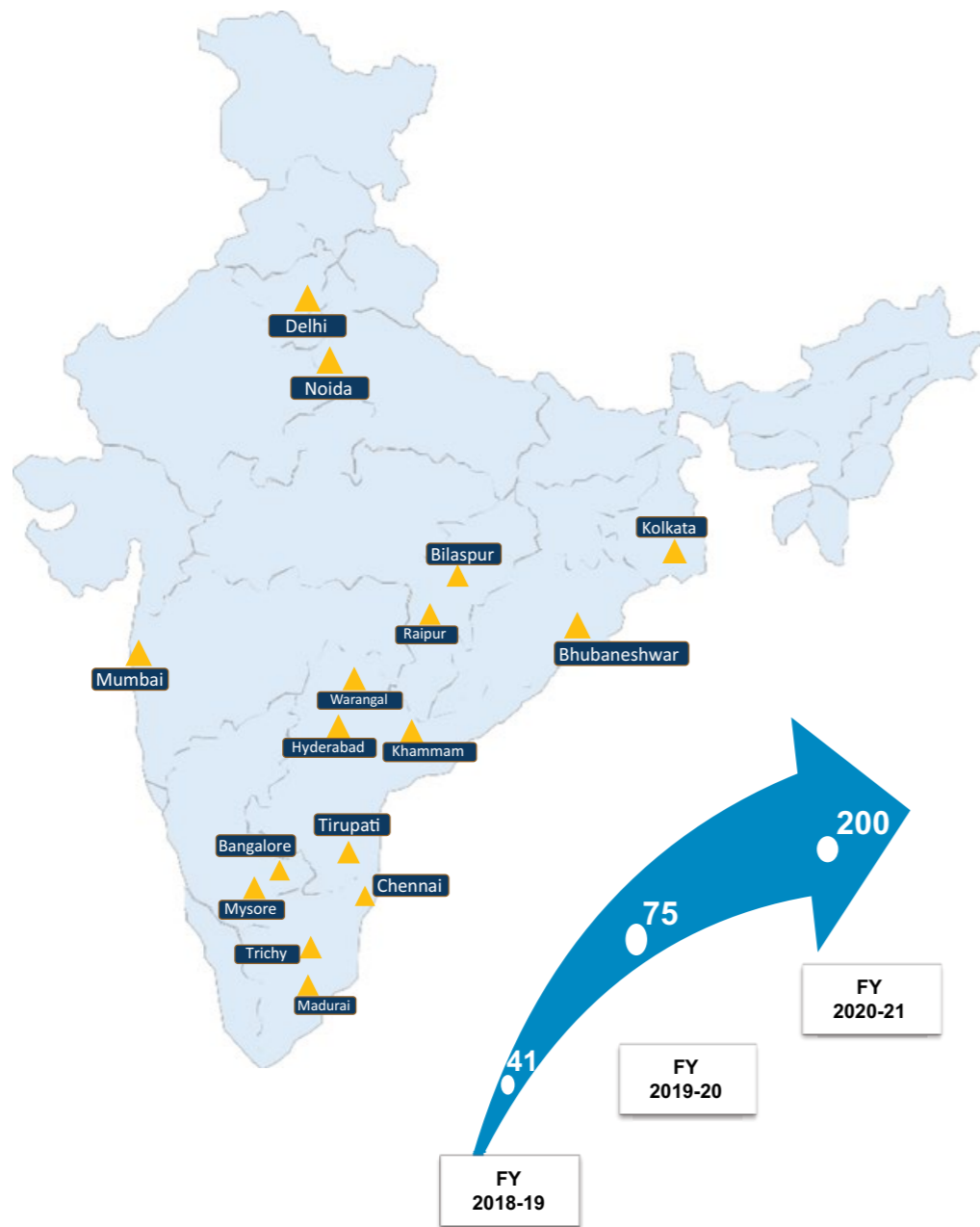- SMBG monitoring through Diabetes Digital Clinic
- SMS on Diabetes education

Health Care call centre
- Questionnaire driven remote Diabetes counselling

APOLLO SUGAR CLINIC PAN INDIA PRESENCE

Our mission is to touch the lives of a million diabetics. Make diabetes 'disease free' by delivering the best outcomes via a proven patient centric care model that combines comprehensive clinical care with sustained lifestyle management & behavioural changes in the individual." Our vision is to provide assured care for diabetes to help lead a disease free lifestyle

With our goal to make India diabetes free, we want the best outcome via a proven patient-centric care model that combines comprehensive clinical care with sustained lifestyle management. Currently, we are serving in 41 clinics across 16 cities. With a view to provide quality service to more population, we are rapidly expanding.

Delhi
Noida
Kolkata
Bilaspur
Raipur
Bhubaneshwar
Mumbai
Warangal
Hyderabad   Khammam
Tirupati
Bangalore
Chennai
Mysore
Trichy
Madurai

200
FY 2020-21

75
FY 2019-20

41
FY 2018-19

DIABETES MANAGEMENT PROGRAM

Why you need continuous assistance in Diabetes?

Diabetes causes nerve, & blood vessel damage. that affects the organs. This occurs without any symptoms till significant harm is done. To avoid this, one needs diet modification, medication adherence, & periodical screening. This means continuous interaction with care teams.

Apollo Sugar Diabetes Care Approach

With our continuous assistance, we help you manage diabetes & avoid its complications with better:

- Self-monitoring of blood glucose levels
- Compliance with diabetes diet plan
- Adherence to medications
- Exercise Regimen

These directly lead to better clinical outcomes in terms of glycemic control, HbA1c control, and reduced risk of hospitalization.

Our Long Term Programs

SUGAR ONE PROGRAM | 1 Day 16 Tests

SUGAR 90 PROGRAM | 90 Days Total Diabetes Management

SUGAR 360 PROGRAM | 1 YEAR EXPERT DIABETES CARE
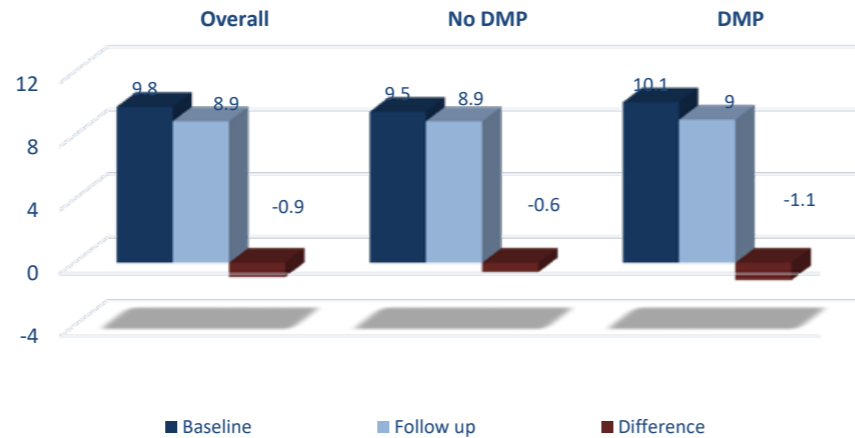
GESTATIONAL DIABETES PROGRAM

Benefits

Consult leading endocrinologists & Diabetologists ,

Diet & lifestyle guidance

Continuous support from care team

Regular complication screening

Reach target sugar levels

Reduce HbA1c levels as per targets

Outcomes

85% of Patients Controlled HbA1c, Hypertension & Cholesterol levels

87% patients are on target for Total Cholesterol

90% female patients on target for Triglycerides

Reduced risk of hospitalization

Reduced risk to organs

- Apollo Sugar Comprehensive Diabetes Management Program (DMP):
- DMP is a structured long term comprehensive care model designed to achieve glycemic goals and reduce complications burden. DMP is driven by an evidence based protocols which is highly patient centric. Currently our Apollo Sugar 360 program is serving more lives and delivering excellent clinical outcomes.
- There is a clinically and statistically significant reduction in HbA1c in DMP (-1.1%) compared to No DMP (-0.6%) patient in an average time interval of 90 days
- Patients on DMP at follow-up more than 10% of the patients with baseline HbA1c >8% had achieved HbA1c goal of <7%
- More than 40% of the patients in DMP are under control and at target for Cholesterol

Clinically significant reduction in HbA1C in patients enrolled in Diabetes Management Program (DMP)

■ Baseline　　■ Follow up　　■ Difference

SMBG outcomes

% of patients who are at target (<130)	35%
Within 2 Weeks	28%
Within 4 Weeks	2%
Within 8 Weeks	5%

% of patients achieved target(<180)	24%
Within 2 weeks	16%
Within 4 Weeks	5%
Within 8 Weeks	3%

- 35% Achieved Pre-meal SMBG targets.
- 28% achieved control / reductions in <2 weeks
- 24% achieved post meal SMBG targets of 180 mg/dL
- No eventful / hypoglycemic episodes occurred for any of the patients

What our PATIENTS are saying!

Dr. Sanjiv Shah

"Structured and connected care with proven good outcomes @ Apollo Sugar Clinics."

Dr. RM Manikandan

"Comprehensive diabetes care provided in a structured way with an efficient team"

Dr. Sandeep Rai

"In Apollo sugar Clinic its Patient First and Always."

Dr. Samantha

"Inspiring us to be the doctors that our patients deserve. The best all the time"

Dr Vikranth Tari

"Best Service starts here"

Dr. Jayaprakashsai

"Been associated with Apollo Sugar since 3Yrs. With the Apollo Sugar Research Team I could Publish Indian Data in International Forums.

Proud to Say Apollo Sugar EMR Best in the Country. We Believe in Team Based Approach in Getting the Best Care for Diabetes.

Thank you Apollo Sugar Team."

Dr. Harini Reddy

"Apollo Sugar Clinic- An umbrella organisation providing pan India services through dedicated and trained team. It strives to achieve prevention and cure for diabetes but with patient's interest at its heart."

Dr. Sanjoy Paul

"Brand is nowadays a trend, at Apollo sugar clinic we the doctors are happy here due to best amenities and freedom to work"

Dr Sudeep Putta

"Apollo sugar is about Comprehensive and compassionate care with sole focus on diabetes."

DEAR App-Diabetes Education & Assessment Radar App

Diabetes education and assessment radar (DEAR) application is a patient engagement tool to educate patients visiting Apollo Sugar Clinics about the underlying diabetes risk and its complications through risk factor scoring. This tool may aid patients to foresee the occurrence of early onset of diabetes-related complications from parameters like Age, Hypertension, BMI, Duration of Diabetes, HbA1C levels, Medication type, Stress and Complication screening reports, so that patients and physician can act proactively to avoid the condition or prevent complications and lead a better quality of life.
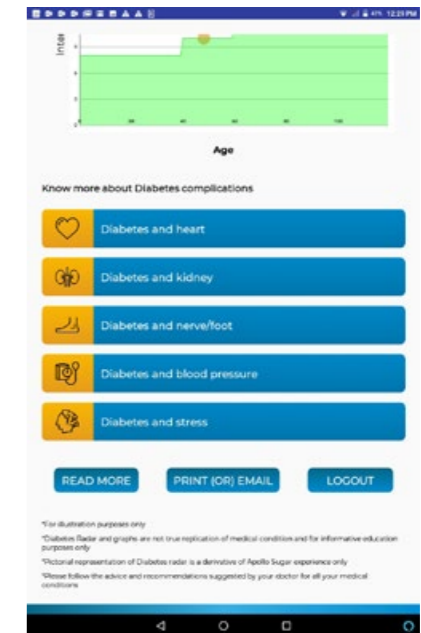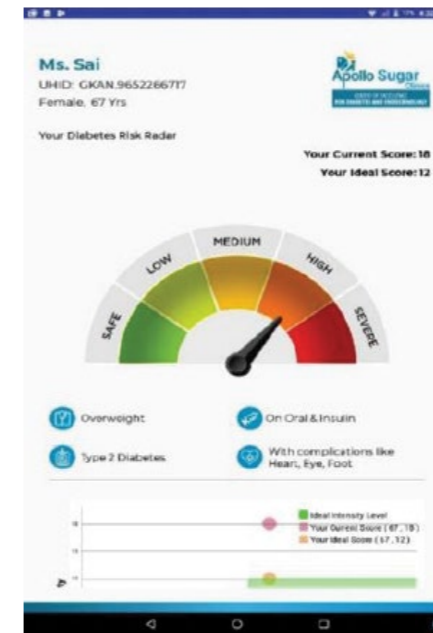
Once the patient get risk score, he/she can read the educational content on Diabetes and its complications. Each patient DEAR score is mailed to the Centre manager, which helps team/care takers to counsel patients accordingly and suggest suitable LTP program to the patient during the post doc counselling session.

Analysis from DEAR app data so far

Risk Radar

Severe risk	1%
High risk	13%
Medium risk	33%
Low risk	39%
Safe zone	14%

Complications Status

Heart	19%
Eye	9%
Kidney	9%
Foot	8%
No complications	55%
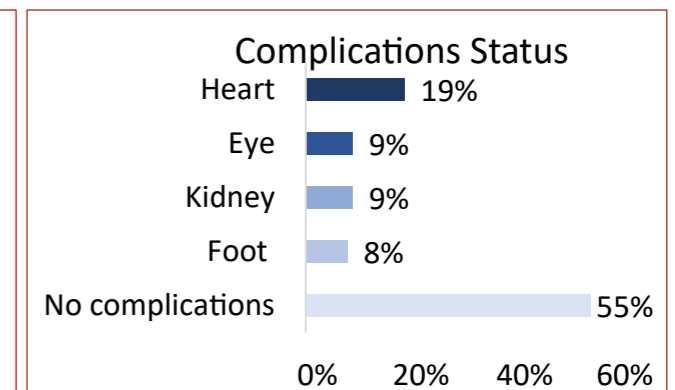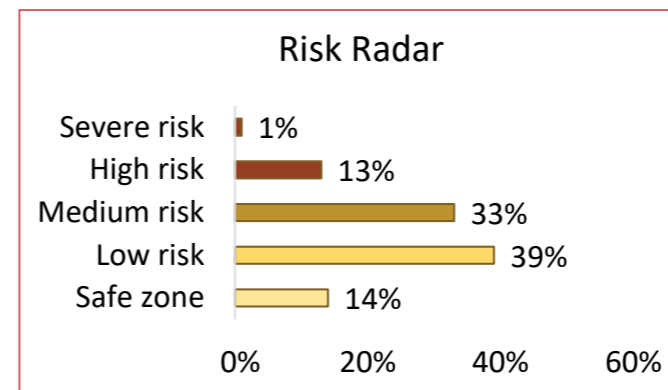
COMMUNITY SCREENING

- ❑ Apollo Sugar conducts screening camps across India with an aim to identify risk population and uncontrolled diabetes to reduce the risk of complications
- ❑ Apollo Sugar had successfully completed >5000 diabetes awareness camps, nutrition drives, and media health talks with doctors.
- ❑ About 5 Lakh Indians were screened till now across India, and gained insights on diabetes prevalence, family history, risk individuals and uncontrolled diabetes.
- ❑ This population information will aid Apollo Sugar to focus on unmet needs in terms of timely diagnosis, interventions, and preventive measures to either prevent/control the diabetes and its associated co-morbidities.

Screening Camp Process Flow

HIGH ENGAGEMENT SCREENING DRIVE

MARKETING EXECUTIVE (1) | PHLEBOTOMIST AND PROMOTER (2) | DIABETES EDUCATOR (1) | LIFESTYLE MANAGEMENT CENTER

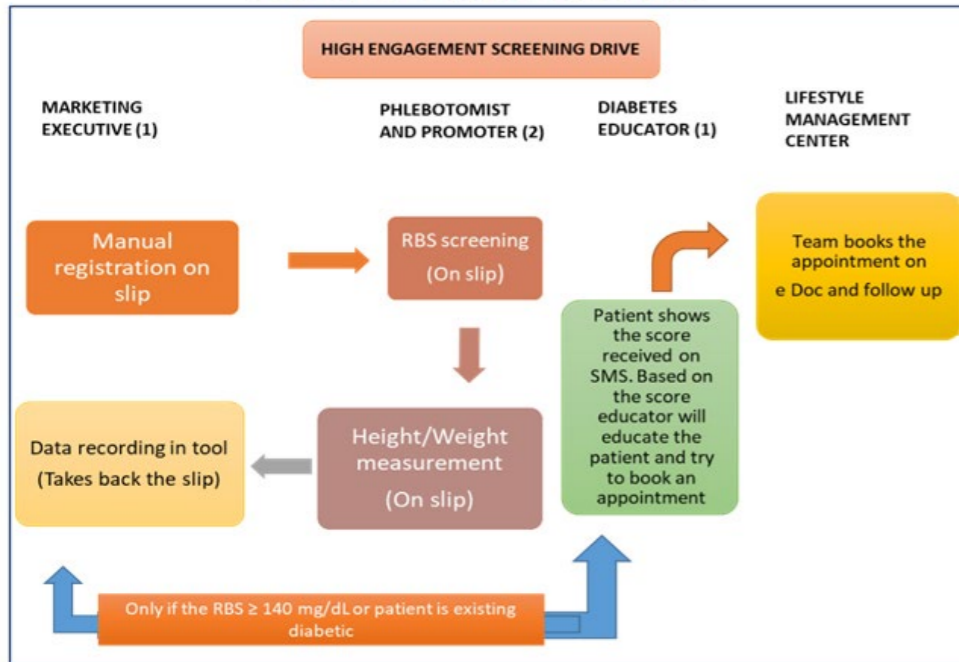Manual registration on slip → RBS screening (On slip) → Team books the appointment on e Doc and follow up

Patient shows the score received on SMS. Based on the score educator will educate the patient and try to book an appointment

Data recording in tool (Takes back the slip) ← Height/Weight measurement (On slip)

Only if the RBS ≥ 140 mg/dL or patient is existing diabetic

Insights into the screening Camps data

Of the total population screened 12% had RBG>200, 17% had RBG between 140-200 and 71% had RBG <140

12% of the screened population had RBS>200 mg/dl

Individuals with RBS>200 and with positive family history of Diabetes are at higher risk of Diabetes.

APOLLO SUGAR APP

Apollo Sugar App is a multi dimensional, multi linguistic, problem solving, highly engaging App with unique 24/7 Sugar Health coach facility, that helps deliver superior and positive patient outcomes with glucose tracking, and self-management of blood glucose levels, along with access to Prescriptions, Lab Reports and personalised Health coaching.

Key Features of Apollo Sugar App
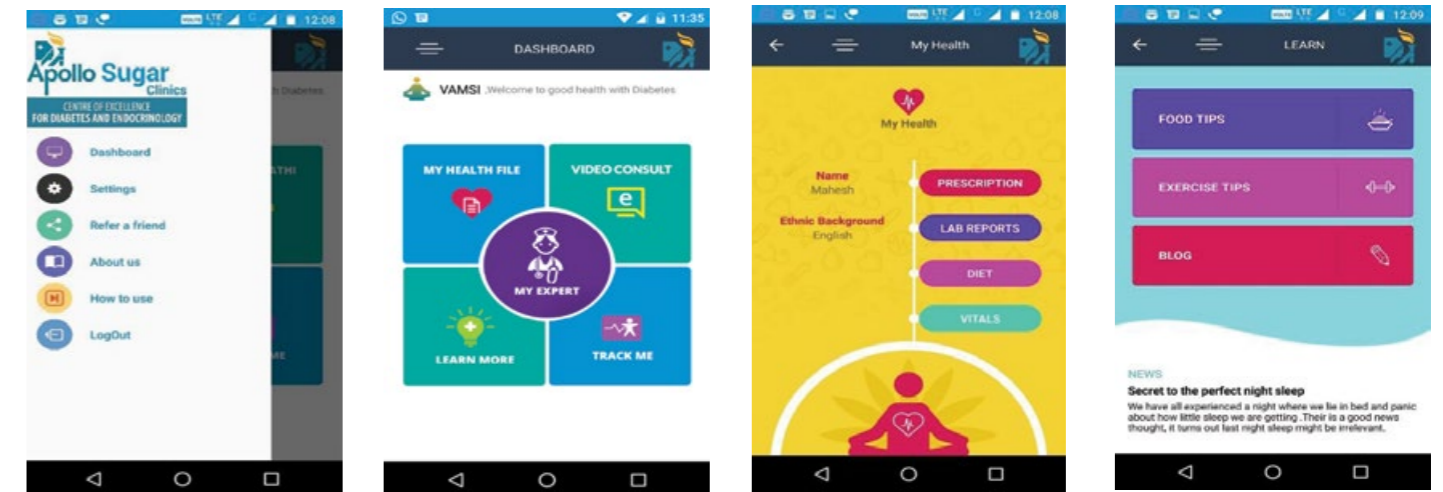
Apollo Sugar App: Health coaching and video consultation

- More than 75000 health interaction were recording in our Apollo sugar app.
- These interactions were common on diet, exercise, medication,Hypoglycemia, SMBG data, Insulin and others
- Nearly 30000 SMBG logs were recording and are continuously monitored by Health coaches Pan India

Apollo Sugar App Health Interactions
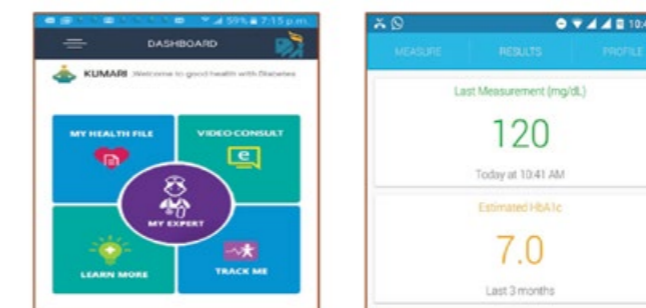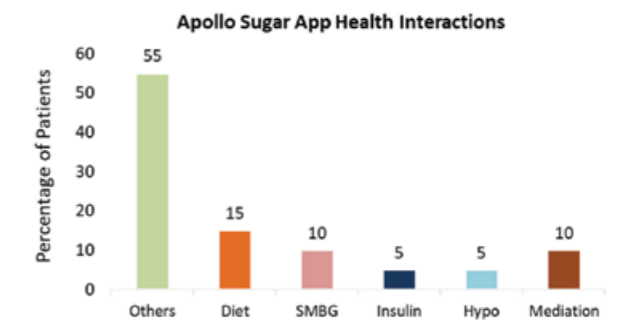
- *Video consultation : Bridge the gap between doctor and patients living in remote places and/or have limit mobility*
- *New features in sugar app will give estimated HbA1C along with Glucose distribution, which may help patient the importance of SMBG and its impact on HbA1C*

DIABETES HOME CARE KIT

Condition Management program is a structured care plan for Diabetes patients to help the patients manage their Diabetes and lead a healthy and productive life. The services as part of the Condition Management Program are designed to engage with the patient beyond the conventional clinic setup and is complimentary to clinic services like Doctor Consultation and laboratory services and not a substitute to it.

The condition management program is a set of unique tools and services offered by Apollo Sugar Clinics constitutes of the following services:

a. Phone calls from Qualified and Trained Diabetes Educator cum Nutritionist to monitor prescription, Diet and Life style management compliance as prescribed by Doctor and keep the patient motivated. Every call is structured to ensure all the queries/clarifications and relevant information are dispensed so as to drive higher compliance and desired clinical outcomes.

b. Apollo Sugar mobile app to track patient's vital, store the patients electronic medical record, monitor patient blood glucose lev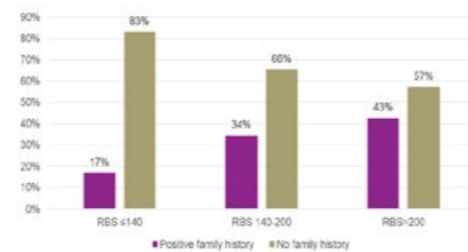els, chat option with the qualified Diabetes educator/Nutritionist to help them understand the disease and manage it on daily basis, along with up-to-date educational materials about the disease and its management including but not limited the Do's and Don'ts of Diabetes care management.

c. Apollo Sugar Condition management program comes with a unique Connected Glucometer which is first of its kind in the world. The "Apollo Sugar – Glucome" Glucometer with the Apollo Sugar

mobile app seamlessly track the blood glucose levels and gives clear insights and actionable data points about the condition of the patient on regular basis. These data points in turn help the treating Doctor and patient manage diabetes well.

d. Available in Apollo Pharmacy, Amazon, Flipkart, Snapdeal and Apollo Sugar website.

GLUCOME AND DIABETES DIGITAL CLINIC

1 GlucoMe is a connected Glucometer with which SMBG values are seamlessly transferred to Apollo Sugar app and are continuously monitored through Sugar-GlucoMe Diabetes Digital Clinic (DDC).

2 The personalized reports, actionable insights, real-time alerts and proactive treatment approach through DDC helps patients manage their blood sugar levels, and improve quality of life

3 Besides patients, it also aids HCPs to monitor their patients initiated on insulin for better titrations

4 The SMBG data, along with Diet/ medication/ and Health coach interactions are stored backend, to analyse clinical data for customised patient counselling.

GlucoMe Blood Glucose Meter — NO Keys, NO On/Off Button, NO Bluetooth, NO Cellular Connectivity, NO Wi-Fi, NO Connector
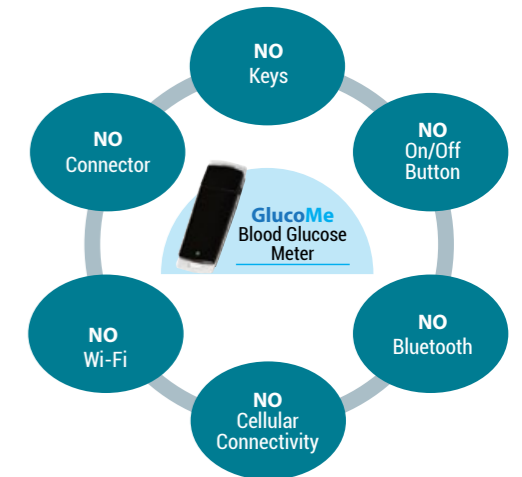
CLINICAL EXCELLENCE SEGMENT

What is Sugar-Glucome Diabetes Digital clinic?
- The Sugar-Glucome Diabetes radar is a web-based monitoring and decision support software for our doctors who use Apollo Sugar Glucome connected SMBG device. It gives doctors unequalled big data insights into real-life patient behavior patterns, and enables digital or face-to-face intervention for the right patients at the right time.

Is the data updated real time?
- Yes. The data in the Sugar App mobile application is synchronized with the Diabetes radar and can be viewed by doctors/careteam in real-time

Can doctors send recommendations to patients through this DDC?
- Yes. The DDC enables medical professionals to remotely monitor patients and adjust treatment plans between physical visits.

Launched Community Engagement Initiative
to prevent, educate and manage diabetes

4 Lakhs free screenings done
across 16 cities

2014   2016   2018

LAUNCH

**CONDITION
MANAGEMENT
PROGRAM**

EVERY MONTH

INITIATIVE

**COMMUNITY
SURVEILLANCE**

**PARTNER OF
SUGAR**

Launch of Apollo Sugar Clinics Ltd.
on September 2014

2015

6000 Electronic medical prescriptions
issued every month

2017

ADA
7 Abstracts

AACE
5 Abstracts

ICOMES
3 Abstracts

IDF
3 Abstracts

RSSDI
16 Abstracts

ESICON
14 Abstracts

ANTI-DIABETES DRUG PRESCRIPTION IN INDIAN SCENARIO: A CROSS SECTIONAL ANALYSIS FROM A LARGE PAN INDIA DATABASE OF THE APOLLO SUGAR CLINICS

Authors: Krishna G. Seshadri, Venkataraman S, Manikandan Rm, Dwarakanath CS, Boochandran TS, Narayanan NK, Jayasree Gopal, Shantharam Duvuru, Usha Ayyagari, Anish Behl.

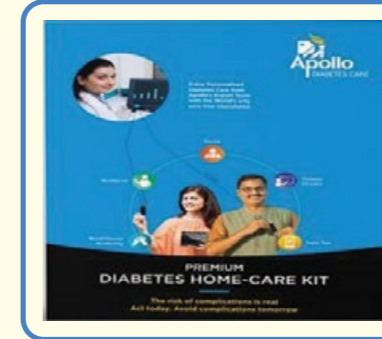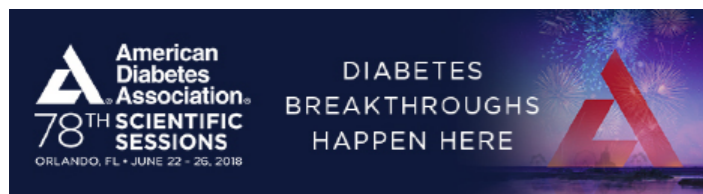**Aim:** Our objective was to determine nature of anti-diabetes prescriptions across the Apollo Sugar Ecosystem, India, a healthcare organization with more than 30 centres (as standalones, secondary and tertiary institutions) that provide care to patients with diabetes

Methods: An eligible 20608 prescriptions with a diagnosis of T2DM from Jan 2016 to June 2017 were included in this analysis to determine the choice of therapy, frequency of usage of different class of anti-diabetes medications, types of insulin, combination and of number of OHAs with insulin. Descriptive analysis was used to report the results.

Results: The mean age of the patients was 53.2 years, 63% males and 37% females. The majority of the patients were on OHAs (68.2%) with 22.8% of patients on OHAs+insulin and 9.0% on insulin alone. Biguanides (55.7%) were most commonly prescribed in combination with other OHAs followed by DPP4 inhibitors (DPP4i) (35%). 63% of patients requiring insulin were using at least one oral drug. The most common drugs used along with insulin included biguanides (50.5%) followed by DPP4i (46.7%). Among Insulins short acting insulin was most commonly prescribed followed by Insulin glargine (22.5%) and premixed insulin and analogues (13.55)

Conclusions: Several observations stand out from this large cross sectional analysis. 1 A significant number of patients are on monotherapies other than MF. 2. Use of DPP4i as the most common drug after MF when two drugs are used reflects a significant shift from a SU dominated practice system in India. 3. SGLT2i and insulin find progressive inclusion when three or more drugs are required. 4. A greater adoption of basal and short acting insulin as opposed to premix insulin in a country that was traditionally considered a premix market. The data provided here give a snap shot of the changing trends in adoption of therapeutic practices with availability of newer medications, physician education and patient ability to afford care.

UNIQUE DIGITAL CARE INTERACTIONS OF DIABETES PATIENTS WITH REMOTE HEALTH COACH THROUGH APOLLO SUGAR APP TO ACHIEVE POSITIVE GLYCEMIC CONTROL OUTCOMES

Authors: Sanjiv Shah, Rabinder Nath Mehrotra, Sambit Das, Ravi S. Erukulapati, Surya Pavan. Reddy, Jana Jayaprakashsai, Kalpana Dash, Balaji Jaganmohan, Usha Ayyagari, Surekha Tippisetty, Vamsi Krishna. Kolukula, Shashank Joshi.

Aim: To evaluate the quality and meaningful interactions of patients with type 2 diabetes mellitus (T2DM) with health coach through Apollo Sugar App and its effects on clinical outcomes

Methods: Apollo Sugar Clinics is a pan-India chain of state of art, integrated care network of diabetes speciality clinics. The current analysis includes digital data of health interactions captured through a novel, unique and well-designed Apollo Sugar App. of great utility value. These live health interactions were between Sugar health coaches and 10,000 patients with T2DM, registered at Apollo Sugar Clinics who downloaded the Apollo Sugar App from Google Play store for the last 6 months. Meaningful health interactions with health coach were identified in 317 patients which were categorised into medication, diet, exercise, and self-monitoring blood glucose (SMBG). Descriptive statistics was applied to analyse the data, to assess clinical outcomes

Results: A total of 10800 health interactions were captured, of which 2000 quality interactions were categorized as meaningful interactions. Among these interactions 29% on diet, 21% on exercise, 19% on medication change, 4% on insulin dose, 2% on hypoglycemia and 25% on meaningful use of SMBG data. SMBG was performed >2times/week by 65% of study population. Pre-meal and post-meal SMBG target were achieved in 35% and 24% of patients, respectively. 28% achieved control reductions in <2 weeks and no hypoglycemic episodes occurred in any of the patients. There was a considerable reduction in mean HbAlc (-0.7%), fasting plasma glucose (-41.5mg/dL) and post-prandial glucose (-100.7mg/dL) at 3 months follow-up.

Conclusions: The current analysis indicates that patient interactions with health coach through an Apollo Sugar app is a modern improved method of behavioural and clinical care, to achieve long term continuity of care for change in outcome of hard end points.

DIABETES PATIENTS' PERCEPTION OF DIET: FACTS AND FADS

Authors: Ravi S. Erukulapati, Sandhya Yalamanchili, Sudha Rani.

Aim: Diet and knowledge of it plays a crucial role in the management of Diabetes. The purpose of the study was to survey Diabetes patients' awareness of the basic ingredients of diet and their insights into the facts and fads of their daily dietary constituents

Methods: An objective qualitative questionnaire-based assessment was performed among outpatient diabetes patients who visited Apollo Sugar diabetes care center in a metropolitan city, India. The questionnaire was answered by patients in a simple 'Yes' or 'No' format relevant to their awareness of various foods. The questions were about the protein, carbohydrate, fat constitution, quantity that could be consumed, and myths surrounding various food products they come across in their daily routine. Patients' perception of diet was categorized into 'correct' and 'incorrect' depending on their response to each question mentioned in a 10-point questionnaire. A score of T was given for each 'correct' answer and '0' for an 'incorrect' answer. Total maximum score each diabetic patient can score is 10/10 and a minimum of 0/10. Appropriate statistics were applied to test the results at significance p 50.05

Results: Total 581 patients with Diabetes were assessed in this study. Patients included were in age range 16 to 85 years with median age of 56 years. Males and females were 60% and 40%, respectively. Among these patients a mean score of 4.5 and median score of 4 was achieved in the questionnaire. 35 (6%) patients achieved the maximum score of 10/10 and 74 (12.7%) patients had a minimum score of 0/10. There was no significant difference in the mean score achieved between males (4.1) and females (3.9). Though it was not statistically significant there was a negative correlation between age and the score (-0.06; p = 0.2)

Conclusion: The survey gave us useful insights into the lack of awareness about daily food products in diabetic patients. Majority of them didn't have adequate knowledge, which recommends for a thorough diet counseling to improve their dietary patterns for better clinical outcomes.

EFFICACY AND SAFETY OF BIPHASIC INSULIN ASPART TREATMENT IN HOSPITALIZED PATIENTS WITH T2DM: A REAL-WORLD STUDY

Authors: Ravi S. Erukulapati, Aparna Yerramilli, Visalakshi Kancherla, Gopala Rao S. Sreelalitha, Anitha Poojari, Fathima Z. Khan, Krishna Reddy Chappidi.

Aim: To evaluate the efficacy and safety of biphasic insulin aspart during first 2 to 8 days of hospital admission of patients with type 2 diabetes (T2DM) for non-glycemia related medical ailments.

Methods: An open-label, non-randomized, observational, single-center study in patients with T2DM aged between 18 and 70 years at a tertiary multispecialty hospital in India. T2DM patients with capillary blood glucose (BG) between 70 mg/dl to 400 mg/dl at admission, requiring subcutaneous biphasic insulin aspart were included in this study. Insulin dosage was individualized as per the clinician's judgement considering the clinical status, HbAlc and other co-morbidities. The primary endpoint was mean capillary BG levels at fasting, prelunch, predinner and at midnight during day 2 to day 8 of hospital stay. Secondary endpoints were frequency and severity of hypoglycemic episodes. Appropriate statistics were applied at 2-tailed p 50.05 significance

Results: Total 205 T2DM patients were included in this study. Median age was 57 years, 66.3% male and 33.7% female. Mean duration of T2DM was 9.9 years, HbAlc 7.3%, BMI 25.9 kg/m2 and hospital stay 8.9 days. The mean (SD) BG at admission was 208.5 (82.9) mg/dL and after usage of Biphasic Insulin Aspart 188.2 (45.3) mg/dL. Mean capillary BG levels at fasting, prelunch, predinner, and at midnight were 166.9 (46.7) mg/dL, 201.0 (58.8) mg/dL, 203.9 (60.1) mg/dL, and 179.0 (48.7) mg/dL respectively. BG readings that met the target BG range (140-180 mg/dL) levels were 34.6%. During the study 5.9% of patient's experienced hypoglycemic event of which 2% were severe requiring intravenous dextrose and 3.9% were mild. There was a significant difference in BG reduction correlating with BMI, HbAlc (p =0.05).

Conclusions: Treatment with biphasic insulin aspart is observed to be effective in achieving optimal BG levels, is well-tolerated with low hypoglycemic events in patients admitted in hospital for non-glycemia related medical ailments.
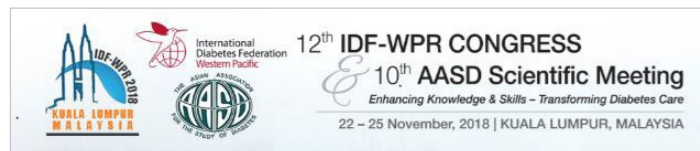
APP-BASED APPROACH TO BASAL INSULIN TITRATION: INITIAL RESULTS OF THE MYDOSECOACH PILOT IN INDIA

Authors: Sanjiv Shah, Sambit Das, Sanjoy Paul, Jayaprakash Sai, Harini Reddy, Narayanan NK, Anish Behl, Radhika V, Surekha T, Vamsi Krishna K.

Purpose: MyDoseCoach (MDC) digital dosing resource is a US FDA approved smartphone APP that can help healthcare providers (HCP) implement remotely, a dose adjustment plan of once-daily basal insulin regimen. The objectives of this pilot project were to evaluate the glycemic parameters and basal insulin dose of patients who used the APP as well record the user experience from patients and physicians.

Methods: Consenting type 2 diabetes (T2D) patients, who were indicated for basal insulin use (Insulin Glargine-100) were included in this 12-week pilot project. The study was conducted between September 2017 and January 2018 in Apollo Sugar Clinics. The starting dose of basal insulin was 10U at bedtime or higher, as per the physician's discretion. Fasting plasma glucose (FPG) target range in the APP was pre-set as 90-120 mg/dL along with a standard titration algorithm. Patients were instructed and trained to perform daily fasting self-monitoring blood glucose (SMBG) and enter the readings in the MDC APP and titrate their daily basal insulin dose, based on the APP recommendations.

Methods: Data of 137 patients who completed the 12-week period are presented. The mean (SD) age was 52.8 (11.0) years, 57% males and 43% females and mean body mass index was 27 (4.1) kg/m2. The mean FPG reduced from 188(70) to 129(57) mg/dL, with a mean reduction of 59 mg/dL. The mean (SD) A1C reduced from 9.9(1.7) to 7.2 (1.4) %, a mean reduction of 2.7%. The average basal insulin dose also increased from 15U at baseline to 23U at the end of 12 weeks. 38% of patients achieved HbA1c (<7%) target after 12 weeks and 20% of the patients achieved FPG target goal of 90-120 mg/dL. No symptomatic hypoglycemia or hospitalization due to hypoglycaemia were reported during the study. The APP was very simple and easy to adopt, as reported by patients and physicians.

Conclusion: Results of this 12-week pilot project conducted in India, indicate that the MDC APP-aided titration of basal insulin is an effective, safe, and user-friendly technology-enabled option for optimizing basal insulin dose in patients with T2D.

Support: Sanofi provided the MyDoseCoach APP to Apollo Sugar Clinic

PERIPHERAL NEUROPATHY RISK IN T2DM PATIENTS THROUGH ASSESSMENT OF VIBRATION PERCEPTION THRESHOLD: A SCREENING REPORT

Authors: S. SHAH, J. Balaji, K. Dash, H.R. Boda, J. Sai, D. Cs, U. Ayyagari, S. Das, R.K. Kshirsagar, N. Shivashankarappa, S. Tippisetty, V.K. Kolukula.

Aim: To screen Pan India T2DM patients having risk of PN on basis of vibration perception threshold (VPT) measurements examined at Apollo Sugar Clinics.

Method: It is a retrospective cross-sectional data collected from electronic medical records of Apollo Sugar Clinics, India. Diabetes patients registered at Apollo sugar clinics were counselled on various diabetes-related micro and macrovascular complications, and patients willing to undergo screening test were selected to measure VPT using Biothesiometer. According to International Diabetes Federation (IDF) clinical practice recommendations on diabetic foot, a VPT value of >25 V in at least one foot are at high risk for neuropathic ulceration, between 21-25 V moderate risk, 15-20 V mild risk and <15V is considered normal. Appropriate statistical tests were applied to identify predictive variables and significance was tested at 2 tailed p ≤0.05.

Results: Across India, a total of 12389 patients were screened to evaluate the risk of diabetic PN. Mean (SD) age was 52.9 (12.2) years, 7867 (63.5%) were males and 4522 (36.5%) were females. Among these patients 48.1% of patients were at risk of diabetic PN (having abnormal VPT). Among these 1907 (15.4%) were having mild risk, 1118 (9%) moderate risk, 2931 (23.7%) severe risk. With the increasing age the risk of diabetic PN was increasing, the highest risk was observed in patients aged >60 years (72%). The mean duration of disease in age group >60 years with PN risk is significantly higher compared to no PN risk patients (11.3 years vs. 8.1 years; p=0.01). Also we observed a strong positive correlation with age and diabetic PN (ρ: 0.42; p <0.01). However, the risk between male and females was not significantly different. Further, there is a significant difference in proportion of patients with abnormal VPT (45.5% vs. 50.3%; p = 0.02) between controlled (HbA1c <7%) and uncontrolled (HbA1c >=7%) T2DM patients.

Discussion: Our current analysis reveals nearly 50% of diabetes patients at risk of diabetic PN, and it is similar to previous cross-sectional studies. Diagnosis of PN by clinical scoring (Michigan Diabetic Neuropathy Score) is time-consuming for busy clinicians. Literature also shows that compared to gold standard NCV measurements VPT measurements are a valid and valuable method for evaluation of severity in PN. Likewise, it has the advantages of being simple, quick, painless and cost-effective where patient cooperation and compliance with VPT is excellent. The important inherent and modifiable risk factors that are responsible for DPN complication were age, long duration of disease and poor glycemic control. The data presented here are representative of true population prevalence and hence proactive strategies are required in primary care clinics to prevent patients from burdening with DPN complication

PATIENT-CENTERIC APPOROACH IN IMPROVING GLYCEMIC BURDEN IN PATIENTS WITH T2DM: AN OBSERVATIONAL DIABETES MANAGEMENT PROGRAM (DMP) AT APOLLO SUGAR CLINIC

Authors: Jayaprakashsai Jana

Purpose: To evaluate glycated hemoglobin HbA1c outcome of patients with T2DM enrolled for long term diabetes management program (DMP).

Methods: A total of 33 T2DM patients enrolled in structured 6 months long term DMP at Apollo Sugar Clinic were included in this preliminary analysis. DMP is a structured care program where along with medication, a planned diet prescription as per the patients' clinical status, regular interaction between Apollo Sugar health coach and patients on diet, exercise, medication adherence and self-monitoring of blood glucose through Apollo Sugar App. Appropriate statistics were applied to report the outcomes.

Results: Mean age of 33 T2DM patients was 52 years, 78% were males and 22% were females. Mean BMI was 28.3 kg/m2 and duration of disease 8 years. Nearly 36% of T2DM patients were associated with comorbidities. Overall mean fasting, prandial and HbA1c before and after DMP were 142.2 and 133.6 mg/dL, 223.4 and 202.7 mg/dl, 8.2 and 7.8%. Among these patients HbA1c reduction was observed in 69% of

patients. The average reduction observed was 0.9%. Further, there was a significantly higher reduction in HbA1c in patients with only T2DM (1.0%) compared to T2DM with at least on comorbid (0.5%) condition.

Conclusions: There is a significant reduction in HbA1c in patients enrolled in DMP. However, to establish the current results and to understand the importance of DMP program large sample size, and for comparison control patient group (not enrolled in DMP) is recommended

PREVALENCE OF DIABETES MELLITUS IN YOUNG ADULTS– AN APOLLO SUGAR TERTIARY CLINIC BASED STUDY REPORT

Authors: Jayaprakashsai Jana, Bhanu Keerthi AV

Background: Over the past decade we have witnessed an increase in the prevalence of Type 2 diabetes Mellitus (T2DM) across the globe which is not only contributed by environmental modifications but also by an inherent genetic constitution. Now a day's diabetes is no longer an adult disease but it has already paved its way in young adults posing a great global challenge to the physicians and health care providers. Thus, the current study was aimed to assess the burden of T2DM and its risk factors in young adults (age <35 years) across India.

Material and methods: The current study is a retrospective analysis of the patients data obtained from electronic medical records of the Apollo Sugar Clinics. Demographic, clinical and biochemical parameters were collected and analysed to identify various factors associated with diabetes in young patients. Patients were categorized into controlled (HbA1c <7) uncontrolled (HbA1c >7), Statistical analysis was done by using SPSS version 20, and a 2-tailed p ≤0.05 was set to be significant.

Results: Out of 287 patients who attended the clinic, the prevalence of T2DM in young adults was found in 14.9% (43), among these patients 86% (37) were males and 14% (6) were females. Mean FPG, PPG and HbA1c were found to be 194.3 mg/dL, 288 mg/dL and 8.7 %, respectively. Further, 55.8% (24) patients had a family history of diabetes, 20.9% (9) patients were found to be hypertensive and 69.7% (30) patients were found to be overweight or obese based on their BMI.

Conclusions: Multiple factors contribute to the early onset of diabetes. Although, the study reports a considerable percentage of young adults with diabetes, adapting a healthy lifestyle and healthy dietary interventions in these individuals can prevent in the progression of the condition as well as prevent from complications. A proactive step in preventing the early onset of diabetes can be achieved by community outreach and awareness programs especially in the high risk or potential population.

BENEFITS OF ADHERENCE TO DIABETES CONDITION MANAGEMENT PROGRAM– A QUESTIONNAIRE BASED EVALUATION STUDY BY APOLLO SUGAR CLINICS

Authors: Dr Vamsi Krishna Kolukula, Ms Bhanu Keerthi AV, Dr Shashank R Joshi

Objective: To assess the effectiveness and adherence of prescribed diabetes condition management program among adults with Type 2 Diabetes mellitus.

Methods: It is a retrospective study where 421 patients with T2DM were taken from the database. Patients who were subscribed to a Diabetes condition management program at the clinic were counselled on diet at baseline. The adherence of patients to the prescribed diet plan was determined based on a structured call calendar and questionnaire throughout the program at pre-counselling status and periodically post-counselling at the clinic. Patients were assessed based on the change in their meal pattern, choice of food and exercise duration. All patients were followed-up for more than 3 months.

Results: On analysis it was found that 9.5% (40) patients who initially did not follow any meal plan at baseline initiated small and frequent meal pattern on follow-up and 97% (354) patients were adherent with the prescribed meal pattern. 6% (24) patients who had no idea on the choice of food at baseline claimed to have a clear idea post-counselling. Out of all patients, 14% (58) who did not exercise at all at baseline were exercising at least for 30 minutes/day post-counselling. All the patients were found to be satisfied with the method of education and awareness on diet.

Limitations: Carbohydrate counting, an important criteria to assess calorie intake could not be measured due to inconsistency in the data. However further clinical benefits of Diabetes condition program will be presented in the near future.

Conclusion: The present study found a notable change in the behavior and awareness of patients under diet management program. It shows that periodic follow-up and counselling helps bringing positive change towards adherence to lifestyle modifications.

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CLINICAL EFFECTIVENESS AND ADHERENCE OF TYPE 2 DIABETES PATIENTS TO GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONIST DULAGLUTIDE: AN EVIDENCE FROM REAL WORLD SETTINGS OF INDIA

Authors: · KG Seshadri · S Venkataraman · J Gopal · R Manikandan · N Narayanan · S Shah · S Tippisetty · VK Kolukula

Keywords: Incretin based therapies 43 Novel agents.

Background and Aims: The use of GLP1 RA is increasing in clinical practice. Several guidelines position GLP1 RA as a first injectable in a subset of patients with T2DM. There is substantial randomized clinical trials evidence to support the use of GLP1 RA in clinical care. It will be important to substantiate this with real-world evidence of efficacy since cost and adherence to injectables are major issues to both adoption and persistence in clinical care. To assess efficacy and adherence to dulaglutide in a real-world setting.

Materials and methods: A cross-sectional retrospective data analysis of T2DM patients initiated on GLP1 RA registered at Apollo Sugar Clinics, from March 2017 to December 2017. Apollo Sugar Clinics is a center of excellence for diabetes management with more than 35 clinics, 90 physicians with substantial EMR penetrance. Baseline demographics and clinical characteristics of patients were extracted from EMR and information on treatment adherence was obtained from patients through Quality of life questionnaire run over the phone. Descriptive statistics was used to present data and appropriate statistical tests was used to compare clinical outcomes between GLP1 RA groups.

Results: A total of 191 patients initiated on GLP 1 RA were selected. Mean age was 48.5 years, 54% were males and 46% were females, of these patients 40% were on dulaglutide. At baseline mean HbA1c was 8.5 (2.0) %, fasting blood glucose was 172.4 (70.5) mg/dL and prandial blood glucose was 252.6 (95.1) mg/dL, body mass index 35 (5.7) kg/m2, and weight 92.8 (16.5) kgs and 48.1% of patients were on concomitant insulin.

At follow-up the average reduction in HbA1c was 1.0 (1.7) %, BMI was 1.2 (1.1) kg/m2 and weight 3.9 (3.2) kgs which were statistically significant, p <0.001. The mean change in BMI

and weight in the dulaglutide group was higher when compared with other GLPs. Around 11% of patients were nonadherent to GLP1 RA; There was a numerically greater adherence with dulaglutide The most common reasons for discontinuation were side effects, hypoglycemia, weight gain and non-availability of drug.

Conclusion: Our analysis demonstrated a significant reduction in HbA1c when GLP1 RA is prescribed along with other anti-diabetes drugs. In the real world setting dulaglutide achieved weight reduction comparable to other GLP1 RAs.

DIABETES EDUCATION AND ASSESSMENT RADAR (DEAR) APPLICATION- A DIABETES EDUCATIONAL AND RISK SCORING APP FOR PATIENTS AT APOLLO SUGAR CLINICS

Authors: · S Das · S Shah · K Dash · U Ayyagari · R Manikandan5 · C Dwarakanath · T Boochandran · S Tippisetty · A Poornima · VK Kolukula

Keywords: Education

Background and Aims: Diabetes education and assessment radar (DEAR) application is a patient engagement tool to educate patients visiting Apollo Sugar Clinics about the underlying diabetes risk and its complications through risk factor scoring. This tool may aid patients to foresee the occurrence of early onset of diabetes-related complications so that patients and physician can act proactively to avoid the condition or prevent complications and lead a better quality of life. Hence, we aimed to screen and identify patients having the risk of complications and associated abnormalities through the DEAR app.

Materials and methods: This is a prospective screening of individuals visiting Apollo Sugar Clinics for doctor consultation from June – August 2018. Apollo Sugar is a center of excellence for diabetes and endocrinology with more than 35 clinics and 90 healthcare experts pan India. The screening was done prior to doctor consultation. Patients were given a mobile tab with DEAR app that captures information through assessing various risk factors that finally gives a risk score. Age, body mass index, duration of disease, hypertension, HbA1c levels, type of medication, stress, and complications screening test were some factors that were considered for risk scoring. The scoring and classification of risk such as no (0-8), low (9-12), medium (13-16), high (17-20) and severe risk (21-25) were defined considering the standard ADA guidelines. All the variable were analyzed using descriptive statistics.

Results: A total of 3867 patients were screened and educated through DEAR app about the risk for complications. Of these 2707 (70%) of the patients were at medium to severe risk. The severity of score increased with increasing age (>65 years), BMI (>30 kg/m2), duration of disease (>5 years), type of medication (oral and insulin) and HbA1c

(>9%). Nearly 42% of the patients had at least one associated abnormality (such as lipid, kidney, eye, or foot) and the most common abnormality that was observed in patients was lipid abnormality with respect to each category of age, BMI, HbA1c. Further, the percentage of patients with medium to severe risk was higher in oral+insulin medication group compared to only oral medication.

Conclusion: To the best of our knowledge across India, Apollo Sugar is the first to attempt to screen a large number of patients for risk of complication using a patient-friendly DEAR app. The scoring obtained enables the healthcare professionals for thorough investigations and can also serve as an early indicator for appropriate diabetes management program to achieve glycemic, blood pressure and lipid targets to delay complications for better patient outcomes. Patients with higher risk score can be educated appropriately by a health care team.

PREVALENCE OF HYPERTENSION AND CO-MORBIDITIES IN YOUNG DIABETICS IN INDIA

Authors: Usha Ayyagari, Boochandran TS, Venkataraman S, Dwarakanath CS, Jayashree Gopal, Anish Behl, Krishna G Seshadri.

Background and aims: Prevalence of diabetes (DM) and associated co-morbidities are increasing in the young in India. The analysis was aimed to evaluate the comorbidities associated with young diabetes patients

Materials and methods: We undertook a retrospective data analysis for the prevalence of hypertension (HTN; newly diagnosed BP ≥140/90 or on medication for HTN) in young diabetics in Apollo Sugar Clinics across India (January 2016- June 2017; N=270000; verifiable lab results in n=13000)

Results: Data is presented as percent (%) or mean (median), 1315 diabetics (10.1%) were ≤40 years old. HTN was present in 635 (48.3%). Of these: T2DM 613 (96.5%), T1DM 17 (2.7%), GDM 5 (0.8%). Mean age 35.8 (37); male 68.4%, female 31.6%; BMI 27.9 (27); HbA1c 8.3% (8.0); FPG 175.2 (156) mg/dL; PPG 267.9 (245) mg/dl; Serum Creatinine 0.87 (0.8) mg/dL; Urine microalbumin 180.4 (15.3) mcg/mg; Lipid profile total cholesterol 194.8 (196.5) mg/dL, LDL 117.8 (121) mg/dL; HDL 39.8 (37) mg/dL; triglycerides 217.6 (221) mg/dL.

Conclusion: Cardiovascular (CV) disease is a rising cause of mortality due to DM in India. Our data suggests 10% of our diabetics are age ≤40, with diagnosed HTN in 48% of this population. Presence of CV risk factors (dyslipidemia, obesity, metabolic syndrome) in this poorly controlled group of hypertensive, young diabetics portends a tsunami of morbidity, healthcare expenditure, and mortality. Screening for diabetes and associated CV risk factors at a younger age with early, aggressive management is necessary in our ethnically high-risk community

BODY MASS INDEX CHANGES IN UNCONTROLLED TYPE 2 DIABETES MELLITUS- A REPORT FROM DIABETES SPECIALITY CLINIC

Authors: · S Paul · VK Kolukula · S Popuri

Keywords: Epidemiology

Background and Aims: To evaluate glycemic control and body mass index (BMI) changes in type 2 diabetes mellitus (T2DM) patients- a report from outpatient Diabetes Speciality health care clinic.

Materials and Methods: The current study is a single center retrospective data analysis of T2DM patients registered at Apollo Sugar Clinics Limited, India. The data were extracted from electronic medical records (June 2017 to April 2018) of Apollo Sugar Clinic, and as a standard process of Apollo sugar clinics, consent is obtained from every patient after registration. The data in EMR is captured at three stages 1. Pre-doc: patient demographics (age, gender, height and weight, blood pressure), past clinical history, past medication, past glycemic values. 2. Doc: Diagnosis, past treatment-related complaints, prescriptions. 3. Post-doc: diet and exercise counseling, insulin training and patient education. In addition, glycemic data, fasting blood glucose (BG), post-prandial BG and glycated hemoglobin (HbA1c) was also captured. Patients with BMI-18.5-24.9 kg/m2 were grouped to normal, BMI 25- 29.9 kg/m2 to overweight and BMI ≥30 kg/m2 to obese. Descriptive statistics were applied to report the results and appropriate statistical tests were performed to test the significance.

Resultss: A total of 426 T2DM patients were included in the analysis, among this 56% were males and 44% were females. Mean age was 51 (±12.37) years, BMI 28.4 kg/m2, and HbA1c 8.5%. Of the total patients 107 (25%) were having normal BMI, 180 (42%) overweight BMI and 139 (33%) obese BMI. The majority (61%) of the patients were prescribed with oral anti-diabetes medication (61%), followed by oral+insulin (38%), and insulin (1%). Patients with HbA1c data were 226 and among these 72% were uncontrolled (HbA1c >7%) and 28% were controlled (HbA1c <=7%). Overall the mean BMI change of -0.5 Kg/m2 was observed in 74 T2DM patients, in obese T2DM patients, there was a clinically significant reduction in BMI -2.2kg/m2. BMI change in uncontrolled diabetes (HbA1c >7%) was -0.4 kg/m2. Further, when BMI change was compared between patients on only orals (38) and oral+insulin (37), we observed a significant reduction in BMI in only orals (-1.4kg/m2), in oral+insulin there is a slight increase in BMI of 0.3kg/m2. In addition, overall the correlation between baseline BMI and follow up BMI was not clinically significant.

Conclusion: The current analysis indicates that BMI reduction is significant in T2DM patients with high HbA1c and on orals antidiabetes medication

COMPREHENSIVE APOLLO SUGAR DIABETES MANAGEMENT PROGRAM: ADHERENCE FOR BETTER CLINICAL OUTCOMES.

Authors: Das, Sambit; RM, Manikandan; TS, Boochandran; Ahmed, Aftab; Suryanarayana, Dwarakanath C; Jaganmohan, Balaji; Jana, Jayaprakashsai; Chaturvedi, Richa; S, Venkataraman; Tippisetty, Surekha; Kolukula, Vamsi K.; Joshi, Shashank R.

Aims: To compare glycemic outcomes of type 2 diabetes mellitus (T2DM) patients enrolled in comprehensive diabetes management program (DMP) at Apollo Sugar Clinics, Pan India.

Methods: A cross sectional retrospective analysis of glycemic control of T2DM patients enrolled in DMP program at Apollo Sugar Clinics, Pan India (June 2017 to December 2017). DMP is a structured long term comprehensive care model to achieve glycemic goals and reduce complications burden. It consists of in-clinic physician and diet consultation and beyond clinic support includes counselling by health coach on medication, diet and exercise, SMBG monitoring, diet and exercise tips through Apollo sugar mobile app. Mean HbA1c reduction was considered to compare between the DMP and NoDMP. Appropriate statistics were applied to test the significant difference between the groups at a p <0.05.

Results: A total of 200 (No DMP=100; DMP=100) uncontrolled T2DM patients were selected for the analysis. Mean age was 51.9 (13.1) years and 63% were males. Mean HbA1c at baseline was 9.8% and at followup was 8.9% and a mean reduction of 0.9% (95% CI: 0.69-1.02; p <0.001). Further, there was also a significant difference in mean HbA1c (9.5% to 8.9% vs. 10.1% to 9.0%) in No DMP and DMP patient groups from baseline to followup. The mean difference in HbA1c is statistically significant in both DMP (Δ: 1.1%, 95% CI: 0.80-1.41, p <0.001) and No DMP (Δ: 0.6%; 95% CI: 0.48-0.74, p <0.001) patient, and the reduction is significantly greater in DMP compared to No DMP. Further in DMP at followup 10% of patients with >8% HbA1c achieved <7% of HbA1c goal.

Conclusion: Our current analysis reveal patients on DMP had better glycemic outcomes than NoDMP patients, suggesting a comprehensive care should be recommended to have a good control over diabetes and prevent from complications burden. However, further prospective studies are required to come up with more tangible data to support DMP.

Key Words: Diabetes, Management, Glycemic control, HbA1c

STATIN USE IN PATIENTS WITH T2DM IN DEVELOPING COUNTRY: HOW TO IMPROVE STATIN USE IN UNCONTROLLED PATIENTS.

Authors: Shah, Sanjiv; TS, Boochandran; NK, Narayanan; S, Venkataraman; Gopal, Jayashree; RM, Manikandan; Anish Behl; Ayyagari, Usha; Das, Sambit; Joshi, Shashank R.

Aims: To evaluate the lipid profiles of patients with T2DM aged >40 years and treatment with statins- a multi-chain management of lipids.

Methods: A cross-sectional retrospective analysis of lipid profiles of T2DM patients register at Apollo Sugar Clinics, India. A total of 15302 patients with lipid profiles, HbA1c >6.5% and on statin therapy from EMR records from Jan 2016 to July 2017 were selected for the analysis. As per ADA guidelines patients at target were categorized as controlled (LDL <100) and not at the target as uncontrolled (LDL ≥100) patients to correlate with HbA1c. Descriptive statistics were used to report the results and to test the significance between the groups an appropriate statistical test was applied with P <0.05 set as significant.

Results: Of 15302 patients, males were 65.6% and females were 34.4%. Mean age was 55 years and mean HBA1c was 8.7%. Patients at target LDL <100 and <70 was 53.1% and 20% respectively. Nearly 12.3% of these patients were on moderate to a high-intensity type of statins. Among patients who were on statins nearly 43% of patients are at controls and 57% were still uncontrolled this indicates for improvements in statin dosage along with lifestyle management. Surprisingly in untreated patients, 54.6% of patients were at target, this could be due to lifestyle management through Apollo Sugar app interactions with a health coach. There was a significant decrease in the proportion of LDL <100 patients with increasing in HbA1c (p <0.001). Mean HbA1c was significantly low in controlled patients compared to uncontrolled patients (LDL: 8.51 vs. 8.96; p<0.001). Most commonly used statin was rosuvastatin (64%) and atorvastatin (36%).

Conclusion: We observed that nearly 43% of patients who were on statins were successful in achieving LDL target. However, patients who were on statins and not achieved the target right statin with right dose along with lifestyle management may bring meaningful clinical outcome.

Key Words: Diabetes, HbA1c, Statins, Lipid profile, LDL

EFFICACY OF SGLT2I AS ADD ON THERAPY TO ORAL HYPOGLYCEMIC AGENTS OR INSULIN IN PATIENTS WITH TYPE 2 DIABETES

Authors: G Seshadri, Krishna; S, Venkataraman; Suryanarayana, Dwarakanath C; RM, Manikandan; TS, Boochandran; NK, Narayanan; Gopal, Jayashree; D, Shantharam; Jaganmohan, Balaji; Kolukula, Vamsi K.

Objective: To assess glycemic outcomes of SGLT2 inhibitors (SGLT2i) as an add on to oral hypoglycemic agents or insulin anti-diabetes drugs in patients with type 2 diabetes mellitus (T2DM)

Methods: A cross-sectional retrospective data analysis of T2DM patients initiated on SGLT2i registered at Apollo Sugar Clinics Limited, India. The Apollo Sugar Group is a large community based clinic practice with over 35 clinics, 90 health care providers and serving more than 75000 patients across nation. A total of 750 T2DM patients were initiated on SGLT2i from Jun 2016 to Dec 2017. Patients were categorized into two groups, G1 is SGLT2i added to oral and G2 added to oral+insulin. Appropriate statistics were applied for analysis and p ≤0.05 is considered to be significant.

Results: Of 750 patients on SGLT2i, 72% of patients were prescribed with SGLT2 inhibitors along with other oral drugs vs. 28% along with insulin. Overall mean (SD) HbA1c was 8.4%; FBG was 165mg/dL and PPBG was 240 mg/dL. The most common drugs prescribed along with SGLT2i were biguanides (62%), followed by DPP4 (55%), SUs (43%) and Insulin (28%). The most commonly used SGLTi is empagliflozin (39%) followed by canagliflozin (33%), and dapagliflozin (28%). Of 750 patients, follow-up HbA1C data was available in 181 patients and these were chosen for efficacy analysis. The mean HbA1c at initiation and at follow-up was 8.5% and 7.9% with a significant mean difference of 0.61% (95% CI: 0.38-0.83; p <0.001). The HbA1c reduction in G1 was 0.59% and G2 was 0.66%. The difference between the groups was numerical and has no statistical significance. At follow up 31.5% of patient in overall and 38.6% of patients in G1 and 12.2% in G2 were able to reach a target goal of < 7% HbA1c. At follow up 5 patients reported hypoglycemia and one patient had urinary tract infection.

Conclusion: Indian patients initiated on SGLT2i have clinically meaningful reduction in HbA1c in combination with OHAs or insulin with low morbidity.

Keywords: Diabetes, type 2 diabetes, SGLT2 inhibitors, Clinical effectiveness, HbA1c

IMPACT ON MONOTHERAPY AND COMBINATION THERAPY IN ACHIEVING TARGET HBA1C IN LARGE HEALTH CARE SYSTEM.

Authors: Krishna G. Seshadri, Venkataraman S, Jayaprakashsai Jana, Dwarakanath C. Suryanarayana, T. S. Boochandran, N. K. Narayanan, Balaji Jaganmohan, Sanjoy Paul.

Objective: The Purpose was to analyse the prescribing patterns of medical practitioners based on the HbA1C of patients at the time of presentation

Methods: Apollo Sugar is a diabetes health care system 20 stand-alone clinics and also 15 of ambulatory care centres attached to secondary and tertiary health care institutions across the country. Providers in these institutions are endocrinologists, or Diabetologist with a computerised prescription entry. Till date an overall 75000 EMR penetrance is observed across the clinics. Glycated haemoglobin (HbA1c) is used as the deciding factor for treatment strategy.

Results: A total of 2774 prescriptions available between January 2016 and 2017 were included for the analysis. The mean age of the patients was 54.5 years, 63% were males and 37% were females. While Biguanides were the single largest monotherapy (53.7%) used, monotherapy with sulphonylureas (13.8%) or DPPIV inhibitors (11.3%) was not uncommon. Initial combination therapy was used in 51.5% of patients with HbA1C ≤8. The most common combinations used were biguanides and DPP4 inhibitors. Initial combinations were used with greater frequency in patients with HbA1C >8%. These include OHAS (69.3%), OHAS + insulin (23.0%) and Insulin alone (7.7%). At follow-up 40% of the patients on one OHA at start reached HbA1c <7% and 54% on two OHAs reached <8%. In

patients whose HbA1c is <8 at start the reduction in HbA1c using monotherapy or dual therapy was 0.57% and 0.54% respectively in an average time interval of 78 days.

Conclusion: The similarity of results in this large sample for mono and dual therapy is surprising. There could be background issues including duration of diseases, comorbidities, and other influencing factors. However, such large prescription analysis from electronic medical records (EMR) to our knowledge has never been published from India.

We hope to evaluate with controlled prospective studies on prescription patterns.

Keywords: Monotherapy, Combination, therapy, HbA1c, Orals, Insulin

A REAL WORLD CLINICAL EFFECTIVENESS OF DPP4 INHIBITORS FROM A LARGE DATA SET OF T2DM PATIENTS IN INDIA

Authors: Venkataraman S, Sanjiv S, Balaji J, Vikranth T, Dwarakanath CS, Anish B, Manikandan RM, Boochandran TS, Mahesh C, Shantharam D, Vamsi K Kolukula, Krishna G. Seshadri.

Objective: To evaluate clinical effectiveness of DPP4 inhibitors (DPP4i) as add on agent in patients with type 2 diabetes mellitus (T2DM).

Methods: A cross-sectional retrospective analysis of T2DM patients initiated on DPP4i registered at Apollo Sugar Clinics India. Apollo Sugar is a large community based clinic practice system with over 35 clinics, 90 health care providers and serving more than 75000 patients. A total of 4507 patients initiated on DPP4i as add on to either oral anti-hyperglycaemic agents or insulin were screened. Among these 1138 patients with baseline and follow up HbA1c were included for the analysis. Appropriate statistics was applied and tested for significance at p ≤0.05.

Results: Mean (SD) age of the patients initiated on DPP4i was 53.7 (10.2) years, of these 66% were males and 34% were females. In 430 (38%) patients DPP4i were added to MF (Group 1) or other monotherapy. In 221 (19%) DPP4i were added to two or more agents (Group 2) and in 69 (6%) patients DPP4i were added to insulin (Group 3). The mean (SD) HbA1c in patients at initiation was 8.7 (1.9) in the whole group, 8.4 (1.8) in Group 1, 8.7 (2.0) in Group 2, and 9.5 (2.0) Group 3. The HbA1c at follow up was 8.3 (Δ: 0.4; 95% CI [0.30 – 0.49]) in the whole group, 7.9 (Δ 0.5; 95% CI [0.31-0.61]) in Group 1; 8.5 (Δ 0.2; 95% CI [0.01-0.39]) in Group 2; and 9.0 (Δ 0.5; 95% CI [0.06-1.08]) in Group 3. 26% (293 of 1138; Δ 1.1; 95% CI [0.94- 1.34]) of patients reached HbA1c <7% in the whole group with 30% (129 of 430), 21% (46 of 221) and 7% (5/69) in Groups 1, 2 and 3 respectively.

Conclusion: We present real world evidence of the efficacy of DPP4i in a large dataset from India. The overall efficacy of these drugs and their ability to help about a third of patients reach therapeutic targets ensure their continued relevance in the therapeutic armamentarium. The greater efficacy of these agents as a second line than later in therapy provides clues to their appropriate positioning.

Keywords: Diabetes, DPP4 inhibitors, HbA1c, Clinical Effectiveness.

HEALTHY RECIPES FOR DIABETES

DIET FOR GDM
Ms. Niharika

Gestational diabetes occurs when the woman's body cannot produce enough of the hormone insulin during pregnancy. Insulin is a hormone made by the pancreas that helps the body cells to use sugar from the blood as energy.

Diet tips in GDM
- Spacing meals and snacks containing carbohydrates to avoid spikes in blood sugar.
- Eat food that has high fibre carbohydrates.
- Start breakfast with protein rich and fibrous carbohydrates
- Do not skip meals.

Snack for GDM: Budha Chakuli
Ingredients:
Oats: 40-50gms
Onion: half (small)
Carrot: 10-20 gms
Capsicum: 10 gms
Paneer: 20-30 gms
Garlic: 1-2 cloves

Method:
1. Grind the oats into a fine powder, mix it well with water to get a semi-thick consistency.
2. Add all the ingredients together and mix it well.
3. Heat the pan, and add one tablespoon of oil on it.
4. Spread the batter evenly on the pan, wait till it's cooked properly from both the sides.
5. The chakuli is ready. Serve it hot!

HEALTHY DIET IN RAMZAN
Ms. Salma

The standard guidelines recommended by the American Diabetes Association have to be followed even during fasting which include: Intake of **whole wheat bread, vegetables, beans and fruits** should be encouraged as they are excellent sources of dietary fiber which prevents constipation and reduces gastric acidity.

Refined products and sweets get digested very quickly in comparison to complex carbohydrates (whole grains and cereals) as they are digested slowly. Excessive consumption of refined carbohydrate such as paratha, puri, samosas, pakodas etc. should be avoided. Choose sugar-free drinks or water to quench thirst. Avoid dehydration- by drinking sufficient water between Iftar and sleep. Dietary indiscretion during the nonfasting period with excessive gorging, or compensatory eating, of carbohydrate and fatty foods contributes to the tendency towards hyperglycemia and weight gain and should be avoided

Renal DIET
Ms. Trupti

When living with chronic kidney disease, managing what you eat and drink can be a challenge. Hence, personalised dietary advice taking into account what you like to eat, how you are feeling, your age, lifestyle, weight, nutritional status and blood test reports helps to prevent malnutrition and reduces the risk of hospitalization.

Important dietary guidelines are
1. A limited protein intake of 0.6 - 0.75 g/kg body wt/day of which at least 50% should come from foods with high biological value.
2. Plan meals to meet recommended energy intake of 30-35kcal/kg body wt/day, especially when the patient experiences loss of appetite, gastrointestinal problems, has aversion to animal protein and feels depressed.
3. Restrict sodium intake 2g/day and should take dietary sources of sodium other than table salt.
4. Individualised restriction of high potassium foods according to serum potassium levels to prevent hyperkalaemia.
5. Restrict fluid allowance in accordance with the urinary output in the last 24 hour

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2 RESULTS

WITHIN THRESHOLD   EXCEEDING THRESHOLD

MONOFILAMENT
Normal: Tactile sensation is felt using a 10 gram monofilament at Hallux, 1st and 5th Metatarsal Heads, bilaterally
Abnormal:25g or 40g filament required to elicit tactile sensation.

VIBRATION PERCEPTION
Normal: Vibration detected at 15V across all 12 test points.
Abnormal: Vibration detected above 25V at any test point.

HOT PERCEPTION
Normal: Perceive increase in temperature from ambient to 45° C, in 5° C increments.
Abnormal: Failure to perceive increase in temperature.

COLD PERCEPTION
Normal: Perceive decrease in temperature from ambient to 25° C, in 5° C increments.
Abnormal: Failure to perceive decrease in temperature.

Reference – National Guidelines for Management of Diabetic Foot, 2nd Edition, Diabetic Foot Society of India

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POS : Paradigm shift in Chronic Care Management

Current Chronic Care Management

- Doctor Consultation
- External Diagnostics
- Medication & Pharmacy
- Self-management of Diet by patient
- Self-management of Chronic disease by patient

Segregated approach for chronic care management

Structured Management with POS support

- Doctor Consultation
- Internal Lab Testing
- Chronic Care Educator
- EMR Management
- Remote Care Services

Sugar's Integrated approach for Chronic care management.

How do we resolve and bring better outcomes through POS?

- **POC Testing**
- **Condition Management Plan**
- **Connected Cardiac Care**
- **Electronic Medical Record Software**

POC-Point of Care Testing:

- Quality results within minutes- Prevents re-visit of patients after obtaining the lab reports
- Integrated with patient's registration and check-in Connected cloud-based EMR and app

Connected Cardiac Care:

- Connected ECG machine is accurate and comprehensive in its analysis, even in the toughest of field conditions.
- Report is auto-analysed, however, sent to the patient through Apollo Sugar app after doctor's approval
- Heart disease is now being detected years earlier in the field - it takes less than a minute!

Condition Management Plan:

Apollo Sugar Condition management program aims to tackle key aspects of SMBG like

- **Increase adherence** - Connected glucometers
- **Address physician interest** – Digital Diabetes clinic helps doctor and care team monitor patients to deliver right interventions at right time and drive both quality and scale

DR. SUBODH KEDIA
Partner of Sugar- Mumbai

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For more information and appointment, call **+91 98665 08552 | 9121292759**

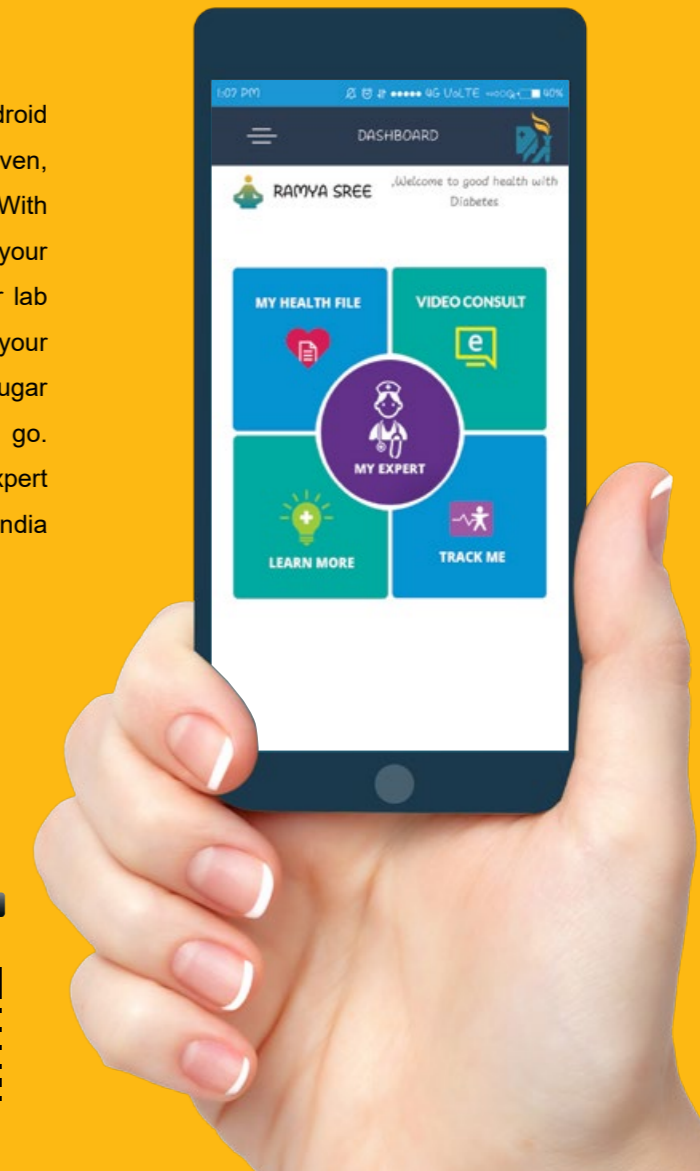Mail id: **pos@apollosugar.com**

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