

Technical Report

April 2021- February 2023

Centre of Excellence in research and clinical services for Madhumeha (Diabetes mellitus)

Awarded by

Ministry of AYUSH, Govt. of India



CENTRAL AYURVEDA RESEARCH INSTITUTE

(Central Council for Research in Ayurvedic Sciences, Ministry of AYUSH,
Govt. of India)

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Activities and achievements in the Centre of Excellence in Research and Clinical services for Madhumeha (Diabetes mellitus)

1. Background

Central Ayurveda Research Institute was awarded “Centre of Excellence in Research and Clinical services for Madhumeha (Diabetes mellitus)” by the Ministry of AYUSH, Govt of India in March 2021. The total fund sanctioned is Rs.7,24,80,400/- for a duration of four years (3+1 year extension upto March 2023 due to Covid pandemic). Rs.2,88,00,000/- was released as first instalment in March 2021 and the scheme got initiated in April 2021. Partial amount of Rs.20,00,000/- under the salary component of the second instalment was released on 20th January 2023.

2. Summary of achievements against deliverables

The Centre of Excellence scheme was sanctioned to CARI, Bengaluru with the following deliverables and targets for the first year. However, the targets (especially targets related to outreach programmes) could not be achieved due to Covid pandemic. Thus, an extension was received for the first-year’s deliverables. The achievements against deliverables are tabulated below April 2021 to February 2023.

| Sl. No. | Deliverables | Targets achieved |
|---------|---|---|
| • | Development of comprehensive document on “Ayurveda guideline for prevention and management of Madhumeha” | Comprehensive document on “Ayurveda guideline for prevention and management of Madhumeha” has been developed |
| • | Validation of Ayurveda approaches for Diabetes mellitus and documentation of outcome of approaches – 200 patients | 1838 OPD patients’ treatment approaches have been documented and validation of outcome is under progress till February 2023 against the target of 200 patients |
| • | Prevention and management of Diabetes with multi-speciality approach of 500 pre-diabetics and diabetics | A total of 599 patients have been under Multi specialty care under CoE scheme. <ul style="list-style-type: none"> • Yoga training to patients with special reference to diabetes management at OPD level and through virtual platform has reached out to 332 beneficiaries till date. • Number of patients of Diabetes who are being managed with combination of Modern medicine and Ayurveda is 267. |

| | | |
|--|---|--|
| | | <ul style="list-style-type: none"> • Additionally, the patients are also managed by different specialists of Ayurveda such as Shalya tantra (in patients with Diabetic foot, Diabetic ulcer, Venous insufficiency, anorectal disorders, Diabetic carbuncles etc) Shalakyta tantra (in patients with Diabetic retinopathy, cataract, hearing loss, tinnitus, periodontitis, gingivitis etc) and Panchakarma (Shamananga and shodhananga procedures) as and when the need arises. |
| <ul style="list-style-type: none"> • Literature search and selection of interventions for validation | <p>Selection of 4 interventions for validation have been completed as per this target. Additionally, following actions/studies have also been taken up</p> <ol style="list-style-type: none"> a) Collection of drugs and manufacturing – 4 formulations – completed b) Quality control studies- 4 formulations- completed c) Development of SoP for medicine preparation- 4 formulations- completed d) Biological activity- Animal studies for anti-diabetic activity of the selected 4 formulations- completed, final report awaited from Nagpur Veterinary College e) Pilot clinical studies on validation of 4 formulations- under progress f) Clinical trials- 2 formulations will be finalised based on results of animal studies and clinical trials will be taken up during the year 2023-24 | |
| <ul style="list-style-type: none"> • Development of 5 IEC materials including literature, audio visuals, SMS alerts | <ul style="list-style-type: none"> • 10 IEC materials for general public are developed and distributed free of cost to the public • A youtube channel has been created for reaching out to wider population https://www.youtube.com/channel/UC3TBI39pJCDvKRqUQculpSg • 5 videos on Diabetic diet developed and uploaded in the CoE YouTube channel • Interviews with experts related to different aspects of Diabetes are created for the CoE YouTube channel and uploaded | |
| <ul style="list-style-type: none"> • Special training on Ayurveda dietetics for patients and public– 10 camps | <p>Conducted 20 trainings against the target of 10.</p> <ul style="list-style-type: none"> • 10 Diabetes awareness talks for general public were conducted at various locations in Bengaluru with total beneficiaries being 391 • 10 special training programmes were conducted for patients of Diabetes at CARI Hospital focussing on understanding Diabetes, Diet in Diabetes and Lifestyle modifications in Diabetes with total beneficiaries –193 | |

| | | |
|--|--|--|
| <ul style="list-style-type: none"> • To introduce e healthcare initiatives for prevention and management of diabetes-development of portal, teleconsultation-coverage around 10000 population | | <p>E- health coverage is extended to more than 26000 population</p> <ul style="list-style-type: none"> • Institute website www.cari.gov.in is fully functional with total impressions of 1870 • Lab and pharmacy data management software coverage is more than 14000. • Teleconsultation portal is operating over the website since the month of January 2023 • SMS alerts to public has been in place with 6096 beneficiaries • Patient data of 1838 OPD patients and 1601 camp consultations till the month of February 2023 is being maintained digitally • A YouTube channel has been created for reaching out to wider population through audio-visual medium which is active since January 2023 with 5 videos uploaded • Diabetes risk predictive module has been developed and is under validation with 1000 subject data using Machine learning and Artificial intelligence techniques. |
| <ul style="list-style-type: none"> • Networking with local governance for camps, one in a week – 50 camps | | <ul style="list-style-type: none"> • A total of 51 camps focussing mainly on Diabetes screening and management were conducted under the CoE scheme with total beneficiaries 1601. |
| <ul style="list-style-type: none"> • E-health like interactions with patients/community, maintenance of online medical records, e-access of information by stakeholders, maintenance of medical records of 500 patients, portal to be made functional | | <ul style="list-style-type: none"> • Repetition of deliverable at Sl. No. 7 above. • Target achieved |
| <ul style="list-style-type: none"> • Technical collaborations with institutes for research studies – MoU with 5 institutes | | <ul style="list-style-type: none"> • 5 Memorandums of Understanding have been signed with the following institutes under CoE • IISc Bengaluru for advanced research in Diabetes on 02.02.2022 • Centre for Incubation Innovation Research and Consultancy for food technology, information technology & drug development on 17.06.2022 • Nagpur Veterinary College for conduct of Pre-clinical safety/efficacy studies on 28.06.2022 |

| | | |
|---|--|--|
| | | <ul style="list-style-type: none"> • Samatvam Science and Research for Human welfare Trust, Bengaluru for conduct of Clinical trials on 05.01.2023 • CSIR-Central Food Technology Research Institute (CFTRI), Mysore for Diabetic diet research on 19.01.2023 |
| • | Networking with local governance for camps, e-health interactions Outreach camps-50 | <ul style="list-style-type: none"> • Repetition of deliverable Sl. No.8 • Target achieved |
| • | Technical collaborations with institutes for research studies – MoU with 5 institutes | <ul style="list-style-type: none"> • Repetition of deliverable at Sl. No. 10 above. • Target achieved |
| • | Protocol for study (after multi-disciplinary consultation). Project covering 500 high risk population of Diabetes | <ul style="list-style-type: none"> • Protocol for clinical studies has been drafted. • Risk assessment questionnaire developed, validated on 1000 subjects and a Diabetes predictive module has been developed using Machine learning and Artificial intelligence techniques in collaboration with experts from Centre for Incubation Innovation Research and Consultancy. |
| • | Training for UG/PG students | <ul style="list-style-type: none"> • 10 training programmes on Research methodology, Biostatistics, Chromatographic techniques and comprehensive management of Diabetes were conducted for Final year UG/First year PG students from different colleges of Karnataka with total number of trainees - 392 |
| • | Initiating documentation for NABL accreditation | <ul style="list-style-type: none"> • Received NABL accreditation for Medical (Entry level) testing labs on 30.11.2022 for Clinical laboratory • Received NABH certification as AYUSH entry level centre on 05.01.2023 |

Note:

- In addition to these deliverables, 6 articles were published in peer reviewed journals and 5 were accepted for publication during the reporting period.
- Similarly, 7 small scale clinical studies were taken up after IEC clearance and CTRI registration (5).
- Initiated the work of developing anti diabetic food preparations in collaboration with reputed organisations viz. Centre for Incubation Innovation Research and Consultancy, Bengaluru and CSIR-Central Food Technology Research Institute (CFTRI), Mysore.

3. Comprehensive report

3.1 Advisory Committee

The following expert advisory committee comprising of experts from various fields such as Ayurveda, Modern Medicine, Pharmacology, Drug development, Food technology, Research and Bio-Statistics has been formed. The committee meets as per need to steer the activities under the scheme.

| Sl.No | Name & designation | Specialization |
|-------|---|------------------------------|
| 1. | Dr S Srikanta, Medical Director, Samatvam Endocrinology Diabetes Centre | Endocrinology & Diabetology |
| 2. | Dr.CR Jayanthi, Retd.Dean, Faculty of Medicine & Professor & HOD of Pharmacology, Bangalore Medical College & Research Institute, Bengaluru | Pharmacology |
| 3. | Dr.Raveendra KR, Professor, Dept. Of Internal Medicine, Bangalore Medical College & Research Institute, Bengaluru | Endocrinology |
| 4. | Dr.Yogesh S Shouche, Scientist G, National Centre for Cell Science (NCCS), Department of Biotechnology, Pune | Diabetology |
| 5. | Dr Ravishankar B, Research Head, Sri Sri College of Ayurvedic Science and Research | Microbiology |
| 6. | Dr Kishore Kumar R, Professor of Ayurveda, Centre for Integrative Medicine and Research, NIMHANS, Bengaluru | Ayurveda & Clinical Research |
| 7. | Dr Supriya Bhalerao, Associate Professor, Interactive Research School for Health Affairs (IRSHA), BharatiVidyapeeth, Pune | Ayurveda & Research |
| 8. | Dr. Sridhar BN, Former Incharge, CARI, Bengaluru | Ayurveda & Dietetics |
| 9. | Dr.Radhika MS, Scientist E & HOD, Department of Dietetics, ICMR-NIN | Food technology |
| 10. | Dr.G.Bhanuprakash Reddy, Scientist-G & HoD, Biochemistry Division, ICMR-NIN, Hyderabad | Food Biochemistry |
| 11. | Dr.N.Samarasimha Reddy, Scientist-E, Clinical Epidemiology Division, ICMR-NIN, Hyderabad | Clinical Epidemiology |
| 12. | Dr. N. Girish, Additional Professor, Dept. Of Epidemiology, National Institute of Mental Health and Neuro Sciences, Bengaluru | Epidemiology |
| 13. | Dr.K.P.Suresh, Sr. Scientist, National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI) | Biostatistics |
| 14. | Dr.Ashok B K, Sr. Research Scientist, R&D, Himalaya Drug Company, Bengaluru | Drug development |

The functioning of the Centre of excellence can be broadly put under the heads of clinical services, academic, training, outreach activities and research.

3.2 Clinical services

3.2.1 Diabetes OPD: Under the scheme, a specialized OPD for patients of Madhumeha is made functional since 22nd July 2021. The patients are provided with free consultation, medicines, laboratory investigations and food & lifestyle counselling. The specialized OPD has catered to 1838 diabetic patients and 5460 follow-up visits since inception offering Ayurveda treatment totalling up to 7298 visits during the period from 22.07.2021 to 28.02.2023. 1049 patients have had free laboratory investigations under the scheme. An extensive and detailed data was collected from all the patients attending the special diabetes OPD under CoE, which was digitally managed using e-formats.

| Department | Male | Female | Total |
|------------------------|------|--------|-------|
| OPD New patients | 1167 | 671 | 1838 |
| OPD Follow-up patients | 3367 | 2093 | 5460 |
| Total | 4534 | 2764 | 7298 |

3.2.2 Yoga: Free yoga classes were conducted in online and offline mode at CARI Hospital and in outreach camps and 332 patients have been benefitted. Classes are conducted under the guidance of professional Yoga teachers. A specialized Yoga module for Diabetes has been developed and is being instructed to patients of Diabetes on a regular basis. Translation of Common Yoga Protocol into Kannada has been done and in circulation A month long online yoga class based on Common yoga protocol was conducted to mark International Yoga day 2021 from 21st May to 21st June 2021. Additionally, Yoga camps have been conducted at different venues near the hospital reaching out to the high risk & Diabetic population.

3.3 Academic, training and outreach activities

3.3.1 Diabetes health camps were conducted from time to time to screen patients for diabetes and diabetic-related issues, provide health-related education, doctor consultation, distribute medicines to treat diabetic and pre-diabetic problems and refer patients to the hospital for further follow-ups as needed. These camps were based on diabetes care and awareness concepts, facilitating the general population to learn how to manage diabetes. Patients were motivated and supported by peers and devoted experts. From February 2022 to February 2023, 51 Medical camps were conducted under CoE, with the number of beneficiaries totalling to 1601.

| Sl no | Date | Camp location | Male | Female | Total patients attended |
|-------|------------|----------------------------|------|--------|-------------------------|
| 1 | 19-02-2022 | Sobha Hill View Apartments | 15 | 12 | 27 |
| 2 | 26-02-2022 | Vajarahalli Anganavadi | 8 | 38 | 46 |

| | | | | | |
|----|----------------|---|----|----|----|
| 3 | 09-03-2022 | Sericulture Institute | 27 | 17 | 44 |
| 4 | 15-03-2022 | Agara Panchayath | 11 | 6 | 17 |
| 5 | 20-03-2022 | Purva Highland Apartment | 16 | 15 | 31 |
| 6 | 21-03-2022 | Matruchaya Trust | 5 | 17 | 22 |
| 7 | 30-03-2022 | Thalghatpura Police Station | 23 | 0 | 23 |
| 8 | 09-04-2022 | Vijaya Heights Apartments | 21 | 8 | 29 |
| 9 | 19-04-2022 | Chowdeshwari Anganavadi | 12 | 25 | 37 |
| 10 | 22-04-2022 | Valley School campus | 29 | 25 | 54 |
| 11 | 24-04-2022 | Manjunath Kalyana Mantapa | 12 | 14 | 26 |
| 12 | 23,24,25-04-22 | National Arogya Expo, Hubballi | 64 | 29 | 93 |
| 13 | 08-05-2022 | Jnana Vikas Foundation | 3 | 2 | 5 |
| 14 | 23-05-2022 | Subramanya Police Station | 34 | 4 | 38 |
| 15 | 25-05-2022 | State Home for Women | 1 | 60 | 61 |
| 16 | 21-06-2022 | IDY, Mysore | 20 | 7 | 27 |
| 17 | 15-07-2022 | Jyothi Institute of Technology | 55 | 31 | 86 |
| 18 | 21-07-2022 | Sandhya Deepa Old age home | 4 | 21 | 25 |
| 19 | 22-07-2022 | Yashasvi International School | 9 | 32 | 41 |
| 20 | 28-07-2022 | APS college grounds | 5 | 3 | 8 |
| 21 | 29-07-2022 | AYUSH expo, Bengaluru | 23 | 16 | 39 |
| 22 | 30-07-2022 | National Arogya fair | 38 | 11 | 49 |
| 23 | 31-07-2022 | Jignasa Expo | 14 | 10 | 24 |
| 24 | 06-08-2022 | Sps Indraprastha Apartment | 14 | 19 | 33 |
| 25 | 12-08-2022 | Thulasi Matha | 14 | 20 | 34 |
| 26 | 20.09.2022 | Silk Institute Quarters, Bangalore | 11 | 7 | 18 |
| 27 | 24.09.2022 | Sreeram Symphony Apartment, Bangalore | 8 | 1 | 9 |
| 28 | 27.09.2022 | Govt. Primary School, Gulbarga Colony | 1 | 15 | 16 |
| 29 | 28.10.2022 | Asha Deepa Old age Home, Bangalore | 12 | 6 | 18 |
| 30 | 01.11.2022 | Luxuria Apartment, Thalghattpura | 17 | 16 | 33 |
| 31 | 17.11.2022) | Jyothi Institute of Commerce and Management | 14 | 19 | 33 |
| 32 | 21.11.2022 | Ashraya Seva Trust, Thalghatpura | 2 | 27 | 29 |
| 33 | 27.11.2022 | Sudhama Old Age, Rajarajeshwari Nagara | 7 | 15 | 22 |
| 34 | 11.12.2022 | Chandapura layout | 10 | 8 | 18 |
| 35 | 11.12.2022 | Shani Mahatma Temple, Chandapura layout | 14 | 5 | 19 |

| | | | | | |
|-------|------------|---|-----|-----|------|
| 36 | 11.12.2022 | Chaya Annapoorna Kalyana Mantapa | 13 | 7 | 20 |
| 37 | 11.12.2022 | Gandadhanadu Janapara Vedika | 10 | 10 | 20 |
| 38 | 16.12.2022 | Lions club JP Nagar | 5 | 15 | 20 |
| 39 | 16.12.2022 | Annapoorna temple | 10 | 10 | 20 |
| 40 | 25.12.2022 | Saanthvana old age home, RR Nagar | 11 | 11 | 22 |
| 41 | 08.01.2023 | Saanthvana old age home, Unit 2, RR Nagar | 14 | 28 | 42 |
| 42 | 17.01.2023 | Aravind Motors, Channasandra | 21 | 3 | 24 |
| 43 | 17.01.2023 | Tata Motors, Bengaluru | 29 | 1 | 30 |
| 44 | 19.01.2023 | Biochemistry dept, CFTRI, Mysore | 13 | 21 | 34 |
| 45 | 19.01.2023 | Food packaging unit, CFTRI | 12 | 22 | 34 |
| 46 | 19.01.2023 | Food safety dept, CFTRI | 24 | 9 | 33 |
| 47 | 19.01.2023 | Molecular Nutrition dept, CFTRI | 22 | 7 | 29 |
| 48 | 06.02.2023 | Centre for fluid dynamics, NAL, Bengaluru | 28 | 11 | 39 |
| 49 | 06.02.2023 | Centre for electromagnetics, NAL, Bengaluru | 23 | 11 | 34 |
| 50 | 07.02.2023 | 4 th PI, CSIR, Bengaluru | 17 | 14 | 31 |
| 51 | 07.02.2023 | Roddam Narasimha Civil Aircraft Centre, Bengaluru | 22 | 13 | 35 |
| Total | | | 847 | 754 | 1601 |

3.3.2 Training programmes:

Four types of training programmes were conducted under CoE scheme.

3.3.2.1 Ten training programmes for general public to raise awareness about Diabetes, its diagnosis, prevention and management through diet and lifestyle led by Dr. Sulochana Bhat, the PI of the scheme.

| Sl.No | Name of the workshop/seminar | Date | Resource Person | Remarks |
|-------|---|---------|-----------------|------------------------|
| 1. | General public on DM Streeshakti sangha at Vajarahalli Anganawadi | 28/2/22 | Dr Kavya | Attended by 100 people |

| | | | | |
|-----|---|----------|------------------------------|------------------------|
| 2. | Awareness program on DM for inmates of Matruchaya trust old age home | 31/03/22 | Dr Niveditha | Attended by 26 members |
| 3. | Awareness program for general public on DM at Jyothi Institute of technology and CIIRC | 15/07/22 | Dr Kavya | Attended by 86 people |
| 4. | Awareness program for general public on Diabetes at Sandyadeepa old age home, RR nagar | 21/7/22 | Dr Amulya | Attended by 25 people |
| 5. | Awareness program for general public on DM at Tulasi Mata | 12/8/22 | Dr Niveditha | Attended by 29 people |
| 6. | Awareness program for general public on DM at Ashadeepa old age home, Thatguni | 27/10/22 | Dr Chandini and Dr Niveditha | Attended by 18 members |
| 7. | Awareness program for general public on DM at Jyothi Institute of commerce and management | 17/11/22 | Dr Amulya | Attended by 34 people |
| 8. | Awareness program for general public on DM at Ashrayaseva Trust, Thalaghatpura | 21/11/22 | Dr Niveditha | Attended by 29 people |
| 9. | Awareness program for general public on DM at Sudhama oldage home, RR nagar | 27/11/22 | Dr Amulya | Attended by 22 people |
| 10. | Awareness program for general public on DM at Santhwana oldage home, RR nagar | 25/12/22 | Dr Amulya | Attended by 22 people |

3.3.2.2 Ten training programmes for patients at CARI Hospital about Diabetes, its diagnosis, prevention and management through diet and lifestyle followed by special training on food recipes and diet in Diabetes with total beneficiaries -193.

| Sl no | DATE | No of Patients attended | Training done by |
|-------|------------|-------------------------|---|
| 1 | 18-11-2022 | 31 | Dr.Kavya N, Dr. Sharada Anand, Dr.Monica KP |
| 2 | 03-01-2023 | 24 | Dr.Kavya.N |
| 3 | 10-01-2023 | 19 | Dr.Vrinda |
| 4 | 18-01-2023 | 14 | Dr.Monica KP |

| | | | |
|----|------------|----|-----------------------------|
| 5 | 21-01-2023 | 9 | Dr.Sharada Anand |
| 6 | 23-01-2023 | 13 | Dr.Chandini Chandrasekharan |
| 7 | 25-01-2023 | 9 | Dr.Niveditha BM |
| 8 | 28-01-2023 | 13 | Dr.Amulya Kannan |
| 9 | 21-02-2023 | 32 | Dr.Sharada Anand |
| 10 | 27.02.2023 | 29 | Dr.Kavya N, Dr.Monica KP |

3.3.2.3 Thirteen Yoga training camps were held at various places around CARI Hospital with an intention to introduce Yoga and lifestyle changes in Diabetic and pre-diabetic populations.

| Sl.No | Location | Date | Remarks |
|-------|---|------------|------------------------|
| 1. | Matruchaya trust | 21/03/2022 | Attended by 22 people |
| 2. | Chowdeshwari Anganwadi | 19/04/22 | Attended by 37 people |
| 3. | Jnanvikasa Foundation | 08/05/22 | Attended by 05 people |
| 4. | Jyothi Institute of technology and CIRC | 15/07/22 | Attended by 86 people |
| 5. | Sandyadeepa old age home, RR nagar | 21/7/22 | Attended by 25 people |
| 6. | Tulsi mata | 12/8/22 | Attended by 29 people |
| 7. | Yoga awareness program for general public on Importance of yoga in general health. Held at CARI, Hospital | 31/08/21 | Attended by 50 people |
| 8. | Ashadeepa old age home, Thatguni | 27/10/22 | Attended by 18 members |
| 9. | Jyothi Institute of commerce and management | 17/11/22 | Attended by 34 people |
| 10. | Sudhama oldage home, RR nagar | 27/11/22 | Attended by 22 people |
| 11. | Saanthvana oldage home Unit -1, RR nagar | 25/12/22 | Attended by 22 people |
| 12. | Saanthvana oldage home Unit -2, RR nagar | 8/1/2023 | Attended by 42 people |
| 13. | Yoga training at CARI, Hospital | 27/2/2023 | Attended by 29 people |

3.3.2.4 Ten training programmes have been conducted to Final year UG/First year PG students from different Ayurveda colleges of Karnataka regarding research methodology,

biostatistics, chromatography techniques and comprehensive management of Diabetes mellitus which was attended by a total of 392 students under the mentorship of Dr. Sulochana Bhat.

| Sl no. | NAME OF THE COLLEGE | DATE | TRAINING PROVIDED BY | NO OF STUDENTS ATTENDED |
|--------|--|------------|---|-------------------------|
| 1. | Sushrutha Ayurvedic Medical College, Bengaluru | 16-03-2022 | Dr.Kavya N Ms.AnaghaJenu Ms.Shilpashree AT Dr.Monica KP | 46 |
| 2 | SDM Institute of Ayurveda and Hospital, Bengaluru | 15-06-2022 | Dr.Kavya N Ms.AnaghaJenu Ms.Shilpashree AT Dr.Amulya Kannan | 29 |
| 3 | JSS Ayurvedic Medical College and Hospital, Bengaluru | 17-06-2022 | Dr.Sharada Anand Ms.AnaghaJenu Ms.Shilpashree AT Dr.Vrinda | 43 |
| 4 | KTG Ayurveda Medical College, Bengaluru | 16-11-2022 | Dr.Kavya N Dr.Monica KP | 35 |
| 5 | Sri Sri College of Ayurvedic Science &Research, Bengaluru | 23-11-2022 | Dr.Chandini Chandrasekharan Ms.AnaghaJenu Ms.Shilpashree AT Dr.Amulya Kannan | 52 |
| 6 | Hillside Ayurvedic Medical College, Bengaluru | 24-11-2022 | Dr.Sharada Anand Dr.Niveditha BM | 39 |
| 7 | Indian Institute of Ayurveda Medicine &Research, Bengaluru | 11-01-2023 | Dr.Amulya Kannan Dr.Niveditha BM | 30 |
| 8 | Ramakrishna Ayurvedic Medical College, Bengaluru | 16-01-2023 | Dr.Sharada Anand Dr.Vrinda | 29 |
| 9 | Government Ayurveda Medical College, Bengaluru | 13-02-2023 | Dr.Kavya N Ms.AnaghaJenu Ms.Shilpashree AT Dr.Chandini Chandrasekharan | 39 |
| 10 | Adichunchanagiri Ayurveda Medical College, Bengaluru | 25.02.2023 | Dr.Amulya Kannan Dr Vrinda | 50 |

3.3.3 e-Healthcare initiatives:

Under the Centre of excellence scheme a static website www.cari.gov.in has been functional for the promotion and introducing e-healthcare initiatives, compliant with Digital India, to reach out to wider population. Total population coverage under e-healthcare initiatives is 26589 till date.

| Sl.No | Initiative | Population coverage |
|-------|----------------------------------|---------------------|
| 1 | e-Medical records (OPD and camp) | 3439 |
| 2 | Website impressions | 1870 |
| 3 | SMS alerts | 6096 |
| 4 | Teleconsultation | 22 |
| 5 | Social media reach | 683 |
| 6 | AYUSLAB-Clinical lab | 2564 |
| 7 | AYUSLAB-Pharmacy | 11908 |
| | Total beneficiaries | 26582 |

3.4 Research activities

The research activities under the CoE are being carried out under different sub-heads.

3.4.1 Literary Research: 567 formulations pertaining to prameha in specific were compiled from 16 Ayurveda treatises. 150 ekaladravyas indicated in prameha from 16 Nighantus were compiled. A detailed literary compilation of anti-diabetic potential of each individual ingredient of the selected 4 formulations from published articles completed. Collection of information on Shakhavarga dravyas from 16 Ayurvedic classical books to understand their anti-diabetic activity is in progress.

3.4.2 Drug development: The Centre of Excellence is mandated with selection of 2 potential formulations for clinical trials. An exhaustive literature survey was carried out in order to list out the formulations which have been mentioned in *chikitsa* of *Prameha*. After a thorough scrutiny and expert opinion, 4 formulations have been shortlisted as potential candidates for further testing. The four formulations thus selected were manufactured at Central Ayurveda Research Institute, Jhansi, and their quality control analysis has been done.

3.4.3 Pre-clinical anti-diabetic studies

Title of the study: Preclinical studies of four anti-diabetic formulations of Central Ayurveda Research Institute (CARI) in high fat diet along with low dose of Streptozotocin induced Diabetes in Wistar rats

Pre-Clinical study to assess efficacy of selected four anti-diabetic formulations was planned after the drug development. Expert committee opinions were taken into consideration to outline the pre-requisites of pre-clinical studies. On 1st April 2022 formal invite was sent to various institutes to collaborate with pre-clinical studies. Some of the institutes approached were:

National Institute of Unani Medicine (Bengaluru, Karnataka), Nagpur Veterinary College (Nagpur, Maharashtra), Veterinary College (Hebbal, Bengaluru), Veterinary College (Gadag, Karnataka), Assam agriculture University, College of Veterinary Science (Assam), University of Agriculture Sciences, Gandhi Krishi Vijnana Kendra (Bengaluru, Karnataka), Government College of Pharmacy (Bengaluru, Karnataka), Natural Remedies (Bengaluru, Karnataka), Veterinary College (Shivamogga, Karnataka), Interactive Research School for Health Affairs (IIRSHA), Bharti Vidyapeeth (Maharashtra). Nagpur Veterinary College was selected as the collaborative institute based on the quotations provided.

Animal Model: High fat diet +low dose streptozotocin induced diabetes model in 42 Wistar rats

Groups: 8 groups in total: Normal rats, Diabetic control, Diabetic control + Standard anti-diabetic drug (Metformin), Diabetic rats + Formulation 1, Diabetic rats + Formulation 2, Diabetic rats + Formulation 3, Diabetic rats + Formulation 4.

Biochemical parameters: Tested on 0th, 14th and 28th day

- Serum Triglyceride
- Total Cholesterol
- HDL-Cholesterol
- LDL-Cholesterol
- Serum Creatinine
- Total protein
- Alanine transaminase (ALT)
- Aspartate amino transferase (AST)
- Alkaline phosphatase (ALP)

Histopathology: At the end of 28th day, representative animals (two from each group) has been sacrificed and histopathology of liver, pancreas and kidney collected.

Timeline of work:

| Sl. No | Timeline | Work progress |
|--------|----------------------|--|
| 1 | 28/06/22 | MoU between CARI, Bengaluru and NVC signed by both the parties |
| | 08/07/22 | IAEC approval received by NVC |
| 2 | 11/08/22 | 1 st instalment of Rs.2,49,000/- released as per MoU towards NVC to start the trial |
| 3 | 14/11/22 to 18/12/22 | Feeding of high fat diet to rats |
| 4 | 19/12/22 | Body weight of rats calculated to fix Streptozotocin (STZ)dose |
| 5 | 21/12/22 | 1st induction of STZ done |
| 6 | 28/12/22 | 2nd induction of STZ done |
| | 3/01/23 | 1st blood collection to check induction of diabetes |
| 7 | 04/01/23 | Feeding of selected four Ayurveda anti-diabetic formulation started |
| 8 | 18/01/23 | 2nd blood collection |
| 9 | 01/02/23 | 3rd blood collection & organ sample collection |

Final report: Awaiting end-line pathological reports to conclude study.

3.4.4 Research projects: 7 minor research projects are taken up under CoE (details below).

3.4.4.1 Study title: Evaluation of anti-diabetic efficacy of four selected classical Ayurvedic poly-herbal formulations in Type-2 Diabetes Mellitus – A randomized pilot study.

Principal Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Kavya N, Dr. Niveditha BM

IEC Obtained – F.6-5/CARI/BNG/IEC Meet/2020-21/399 dt 07.06.22

CTRI Registration - CTRI/2022/07/044018 on 14.07.22

A pilot randomized clinical trial on 24 patients of four groups. Freshly diagnosed or known diabetic subjects with HbA1c of 7-9% was included in the study. Each group was given treatment as it is along with Varadi kwatha, Mustadi kwatha, Bhunimbadi kwatha and Khadiradi kwatha respectively for a period of 12 weeks. Follow up was done at 4, 8, 12th week.

| Total no of subjects screened | Total no of subjects enrolled | Total no of subjects completed | Total no of subjects dropped out | No of continuing subjects |
|-------------------------------|-------------------------------|--------------------------------|----------------------------------|---------------------------|
| 51 | 24 | 03 | 05 | 16 |

3.4.4.2 Study title: Clinical evaluation of anti-diabetic efficacy of ‘ Kaphaja Pramehahara Yoga, an Ayurveda poly-herbal formulations in Pre-diabetes – A pilot study.

Principal Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Amulya Kannan

IEC Obtained – F.6-5/CARI/BNG/IEC Meet/2020-21/399 (C) dt 07.06.2022

CTRI Registration – CTRI/2022/07/044484 on 29.07.2022

A pilot clinical trial on 6 patients to evaluate the clinical efficacy of Kaphaja Pramehahara Yoga mentioned in Bhavaprakasha in pre-diabetes patients for duration of 12 weeks. Newly diagnosed drug naïve pre-diabetic subjects with HbA1c of 5.7-6.4% will be included in the study. Follow up will be done at 4, 8, 12th week.

| Total no of subjects screened | Total no of subjects enrolled | Total no of subjects completed | Total no of subjects dropped out | No of continuing subjects |
|-------------------------------|-------------------------------|--------------------------------|----------------------------------|---------------------------|
| 07 | 04 | 00 | 00 | 04 |

3.4.4.3 Study title: Evaluation of bio-availability of four Ayurvedic poly-herbal formulations in healthy volunteers -A cross over Randomized Clinical Trial

Principal Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Sharada Anand, Dr.Kavya.N, Ms Shilpashree AT
IEC Obtained- F.6-5/CARI/BNG/IEC Meet/2020-21/399 (B) dt 07.06.22
CTRI Registration – CTRI/2022/07/044447 on 28-07-22

It is an open label cross-over Randomised Clinical Trial which will be conducted on six healthy volunteer through HPTLC fingerprinting with the objective to evaluate the bio-availability of four poly-herbal formulations (Varadi kvatha, Mustadi kvatha, Bhunimbadi churna, Khadiradi kvatha).

On day one, 2 ml of blood will be withdrawn from venous puncture (canula will be inserted). Then, the interventional drug will be administered accordingly in the prescribed dose through oral route. Later, blood will be collected after 0.5, 1, 1.5, 2, 3, 6, 12 and 24 hour. All the samples will be sent for HPTLC fingerprinting for the evaluation of bioavailability in the plasma. The study will be repeated on the same volunteers using different formulation after a washout period of 15 days.

Status – Project is yet to begin. Standard markers have been obtained for the study. Trial batches to confirm the solvent system and marker concentration is under progress

3.4.4.4 Study title: Knowledge, Attitude and Practices related to Madhumeha (Diabetes)

Principial Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Vrinda, Dr. Monica KP

IEC Obtained – F.6-5/CARI/BNG/IEC Meet/2020-21/399(D)

CTRI Registration - CTRI/2022/07/043977 on 13-07- 2022

A cross-sectional study was carried out by using a Knowledge, Attitude and Practice (KAP) questionnaire. It was conducted on population visiting hospital of Central Ayurveda Research Institute to assess the influence of Ayurveda health care and Yoga practices related to diabetes with a sample size of 350 subjects.

| | | |
|--------------------------------|-------------------|---------------------|
| Date of initiation: 13.10.2022 | | |
| Total completed | Total no of males | Total no of females |
| 350 | 185 | 165 |

3.4.4.5 Study title: Development of predictive system for diagnosing the risk of Diabetes using machine learning techniques.

Principial Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Kavya N, Dr.Harshvardhan Tiwari, Ms Anagha Jenu

IEC Obtained – F.6-5/CARI/BNG/IEC Meet/2020-21/399 (A) dt 07.06.22)

CTRI Registration – CTRI/2022/07/043988 on 13-07-22

A cross-sectional study to evaluate the risk of development of Diabetes mellitus in general public and also to develop a Diabetes predictive model for early detection of Diabetes mellitus, based on machine learning techniques with a sample size of 1000 participants.

Status: Data collection of 1000 subjects completed and data subjected to Machine learning using 10 cross K-NN validation, Naïve Bayes, Decision tree, Logistic regression, Support vector machine validation tools. Software developed after model validation. Copyright application for the Predictive system is under progress.

3.4.4.6 Study title: A Cross-sectional study of Knowledge, Attitude and Practice related to Madhumeha (Diabetes)

Principal Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Vrinda, Dr. Monica KP, Dr. Kavya N

IEC Obtained – F.No.6-5/2022-CARI/BNG/ETHI.COMMI./2404 dt 09.02.23

Accurate facts can help people to assess their risk of diabetes, inspire them to seek proper treatment and care. With this view, a KAP survey was conducted in central Ayurveda Research Institute along with a target of 350 participants. However, a need to extend the survey beyond Ayurveda hospital was conceived. So it is extended to two government aided Allopathy and Ayurveda hospital present in Semi-urban/Rural and Urban region of Bangalore.

| Study sites | Total completed | Total no of males | Total no of females |
|---|--|-------------------|---------------------|
| Central Ayurveda Research Institute | 350 | 185 | 165 |
| Community Health Centre, Kaggalipura Government Hospital, Bengaluru | 48 | 26 | 22 |
| Sri Jayachamarajendra Ayurveda Hospital, GAMC, Bengaluru. | Official permission obtained, survey yet to start | | |
| Victoria Hospital, BMCRI, Bengaluru | Proposal submitted to Institutional Ethical Committee, BMCRI | | |

3.4.4.7 A pilot study to evaluate the role of Yoga capsule as add-on in reducing Serum Glucose levels in diabetes.

Principal Investigator – Dr. Sulochana Bhat

Co-Investigator – Dr. Monica KP, Dr. Chandini Chandrasekharan

IEC Obtained – F.No.6-5/2022-CARI/BNG/ETHI.COMMI./2405 dt 09.02.23

An open trial to validate the clinical efficacy of Yoga Capsule in reducing serum glucose levels in patients of Diabetes. The eligible participants will be randomized in two groups. In group-1, the patient is made to practice yoga for 15 minutes according to Yoga Capsule twice a day as an additional intervention to the conventional treatment for 84 days on a regular basis. This will be monitored in the institute's yoga hall or any online platform. In group-2, the conventional treatment will remain without any

additional intervention. Both the groups will be assessed for Diabetes Symptoms Questionnaire (DSQ) at baseline, 28 days 56 days and 84 days. Blood investigations like HbA1c, FBS, PPBS and Hemogram will be validated before and after the intervention.

Status – Project is yet to begin.

3.4.5 Food development:

This was the proposed target for next year, however, developing SoPs for ready to eat/cook anti-diabetic food supplements/meal replacements was initiated. Collaboration with Centre for Incubation, Innovation, Research and consultancy (CIIRC), Bengaluru and CSIR-Central Food Technology Research Institute (CFTRI), Mysore has been done through MoU. Discussions were held with scientists of food technology of the two institutes for development of ready to eat / cook anti-diabetic food preparations, based on the literature survey and Ayurveda principles of *pathyaahara*. 2 preparations are under consideration which include a Barley based Soup powder and cookies. Other food articles are also being considered for further evaluation.

3.4.6 Technical collaborations: 5 Technical collaborations for conduct of various research activities are also done under CoE.

| Sl. No | Details of MoU | Name of Institute, University/ Organization | Date of Execution of MoU | Period of MoU | Purpose of the MoU |
|--------|--|--|--------------------------|---------------|---|
| 1 | MoU signed for collaboration on academic programmes, research partnerships, and training to bring science engineering and clinical results to society | Indian Institute of Science, Bengaluru | 02.02.2022 | 3 yrs | Collaboration on research, training, innovation and academic programmes |
| 2 | MoU signed under Centre of Excellence Scheme for collaborations on studies pertaining to food technology and Information technology including Machine learning and Artificial intelligence | Centre for Incubation, Innovation, Research and Consultancy (CIIRC), Bengaluru | 17.06.2022 | 3 yrs | Collaboration on Food technology, Information technology, Drug standardization and Quality control research |
| 3 | MoU signed under Centre of Excellence Scheme for conduct of | Nagpur Veterinary | 28.06.2022 | 3 yrs | Collaboration on Pre-clinical studies on |

| | | | | | |
|---|--|--|------------|-------|--|
| | Safety and efficacy animal studies on Ayurveda Anti-diabetic formulations | College, Nagpur | | | Ayurveda formulations |
| 4 | MoU signed under Centre of Excellence Scheme for conduct of Clinical trials | Samatvam Science and Research for Human welfare Trust, Bengaluru | 05.01.2023 | 3 yrs | Collaboration on Clinical studies on Ayurveda formulations |
| 5 | MoU signed under Centre of Excellence Scheme for conduct of Nutrition and food technology research | Central Food Technology Research Institute, Mysore | 19.01.2023 | 3 yrs | Collaboration on Nutrition and food technology research |

3.5 Upgradation of the Institute through CoE scheme

3.5.1 Clinical laboratory

The following laboratory instruments were purchased under CoE scheme and installed for pathology diagnostics and investigations

1. Urine analyzer
2. ERBA Biochemistry Analyser
3. ERBA- 5part Hematology Analyser
4. RBAAdvance Four Chanel Coag. Analyser
5. Erba HB-Varioanalyser
6. Hormone analyzer Finecare Instruments
7. Blood Tube Mixer
8. Chemicals, reagents and other lab consumables necessary for the functioning of all the above instruments

Infrastructural development of the laboratory includes the following

1. Purchase of Phlebotomy Chair
2. Aluminum partition work
3. Installation of laboratory taps
4. Construction of slabs

3.5.2 Botany Section

- Herbal garden of the institute was upgraded with layouts.
- Irrigation facility was ensured by expanding pipeline system.

3.5.3 Drug Standardisation

- High performance Thin Layer Chromatography was installed along with other necessary equipment like Nitrogen gas generator, computer, printer and UPS system for the drug analysis and standardization.
- Aluminum partition and window sealing were done in HPTLC unit to protect the equipment from dust and moist. Laboratory water taps were also installed.

- Chemicals, reagents and other lab consumables were purchased for the conduction of analysis in HPTLC and DSRU units.
- Magnus trinocular microscope procured for drug microscopy studies.

3.5.4 Hospital services

- Ambulance and its necessary accessories were purchased for the transportation of patients as well as to use it as a mobile clinic for the conduction of Diabetes camps under CoE scheme.
- Unlimited power supply was installed for power backup which covers the entire hospital building (OPDs, Pharmacy, Pathology Lab, Yoga-hall, Marma and Shalya Units, Panchakarma unit, IPD)

3.5.5 Software purchased

- Laboratory Information Management system by AYUSLAB for Clinical laboratory, CARI-installed on 30.06.2022
- Pharmacy Management system by AYUSLAB for Pharmacy, CARI installed on 08.09.2022.
- STATA/SE 17 statistical software installed on 01.10.2022 to carry out all the Statistical analysis for research activities of the Institute.

3.6 Publications

| Sl.No | Title | Journal | Authors | Status |
|-------|--|--|---|----------------------------|
| 1. | Yava (Barley): A potential dietary component for management of Metabolic disorders w.s.r. to Diabetes Mellitus-A multi-case report | International Journal of Ayurvedic and Herbal Medicine | 1. Kavya N 2. Amulya Kannan 3. Monica K P 4. Sulochana Bhat | Published (July 2022) |
| 2. | Ayurveda Single drug therapy for Prameha in Nighantu Sahitya-A review | International Journal of Science and Research Archive | 1. Monica K P 2. Kavya N 3. Raghavendra Naik 4. Amulya Kannan 5. Sulochana Bhat | Published (September 2022) |
| 3. | Literary review on formulations for Prameha management from various Ayurveda treatises | Journal of Drug Research in Ayurvedic Sciences | 1. Amulya Kannan 2. Raghavendra Naik 3. Kavya N 4. Monica KP 5. Sulochana Bhat | Published (November 2022) |
| 4. | ĀmalakīSvarasa (<i>Phyllanthus emblica</i>) – A Potential Single Drug Intervention in Management Of | International Journal of Research in Ayurveda and Pharmacy | 1. Amulya Kannan 2. Kavya N 3. Nivedita BM 4. Monica KP 5. Sulochana Bhat | Published (August 2022) |

| | | | | |
|-----|---|--|---|-----------------------------------|
| | Prameha (Diabetes Mellitus): A Case Study | | | |
| 5. | Anti-diabetic formulations –A laghutrayee review | Journal of Ayurveda | 1. Amulya Kannan 2. Raghavendra Naik 3. Vrinda 4. Shilpashree A T 5. Kavya N 6. Sulochana Bhat | Submitted |
| 6. | Chromatographic Techniques for Traditional and Herbal Anti-Diabetic Mellitus Drug Analysis: A Review on Recent Advances | (TrAC)Trends InAnalytical Chemistry | 1. AT Shilpashree 2. Kavya Nagarajan 3. Amulya Kannan 4. Sulochana Bhat | Submitted |
| 7. | A literary study of Rasa Tantra Sar Va Siddha Prayog samgraha with special reference to pramehaharayogas | Journal of Ayurveda | 1. Vrinda 2. Kavya N 3. Sharada Anand 4. Sulochana Bhat | Submitted |
| 8. | Efficacious standalone Ayurveda treatment in management of Diabetes mellitus- II - A case report. | Journal Ayurveda and Integrated Medical Sciences. | 1. Dr.Amulya Kannan 2. Dr.Chandini Chandrashekharan 3. Dr.Sulochana Bhat | Published (February 2023) |
| 9. | The practice of Yoga and Ayurveda in the management of Anxiety, Hypertension and Diabetes mellitus- a case study | International Research Journal of Ayurveda and Yoga. | 1. Dr. Monica K P 2. Dr. Kavya N 3. Dr. Sulochana Bhat | Published (January 2023) |
| 10. | Ayurvedic interventions in the management of Venous stasis dermatitis in a patient with diabetes- 2: A case report | Journal of Research in Ayurvedic Sciences | 1. Dr.Chandini Chandrashekaran 2. Dr.Amulya Kannan 3. Miss.Anagha Jenu 4. Dr.Sulochana Bhat | Review and revision under process |

| | | | | |
|-----|---|-------------------------------------|---|-----------|
| 11. | Reporting discrepancy of Diabetes and its Determinants among adult residents of Bangalore district of Karnataka | Indian Journal of Medical Research. | 1. Miss. Anagha Jenu 2. Dr. Kavya N 3. Dr. Sulochana Bhat | Submitted |
|-----|---|-------------------------------------|---|-----------|

3.7 IEC materials:

The below IEC materials have been developed under CoE scheme and are being distributed to public at CARI Hospital, camps and other outreach programmes.

- i. ಮಧುಮೇಹ ನಿಯಂತ್ರಣ ಹಾಗೂ ನಿರ್ವಹಣೆಗೆ ಸಮಗ್ರ ಸೂತ್ರ (Prevention and Management of Diabetes mellitus)
- ii. ಸಾಮಾನ್ಯ ಯೋಗ ಕೈಪಿಡಿ (Common Yoga Protocol)
- iii. ಆಹಾರ ಸೇವನೆಯ ಮುಖ್ಯ ನಿಯಮಗಳು(Regimens to be followed during food consumption)
- iv. ಟೈಪ್ -೨ ಮಧುಮೇಹದ ಬಗ್ಗೆ ಮುಖ್ಯ ಸಂಗತಿಗಳು(Important facts about Type-2 Diabetes mellitus)
- v. Diabetic eye care charts for patients
- vi. Diabetic foot care charts for patients
- vii. Diabetic skin care charts for patients
- viii. IEC material on FAQs (Essentials of Madhumeha and its management)
- ix. Flyer on Gestational Diabetes Mellitus in Kannada
- x. Prepared IEC pamphlet on 'Pathya ahara (healthy food ingredient) for a diabetic' and is under expert review.

Accreditation of the Institute

National Accreditation Board for Hospitals & Healthcare Providers

(Constituent Board of Quality Council of India)

CERTIFICATION

Central Ayurveda Research Institute

No.12 Manavarthe Kaval, Uttarahalli Hobli, Bangalore

Bangalore-560109, Karnataka

has been assessed and found to comply with NABH AYUSH
Entry Level-Centre standards.

This certificate is valid for the Scope as specified in the
annexure subject to continued compliance with the AYUSH
Entry Level-Centre certification requirements.

Valid from :Jan 05, 2023
Valid thru :Jan 04, 2025



Certificate No.
EAC-2023-0006

Dr. Atul Mohan Kochhar
Chief Executive Officer

National Accreditation Board for Hospitals & Healthcare Providers, 5th Floor, ITPI Building, 4A, Ring Road, IP Estate, New Delhi 110 002, India
Phone: +91-11-42600600, Fax: +91-11-2332 3415 • Email: helpdesk@nabh.co • Website: www.nabh.co



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National Accreditation Board for Testing and Calibration Laboratories
(A Constituent Board of Quality Council of India)
Medical (Entry Level) Testing Labs

CERTIFICATE

Criteria: NABL 128 [NABL Medical (Entry Level) Testing Labs {NABL M(EL)T Labs} Program]

Certificate No.: NABL-M(EL)T-00394

Issue Date: 30-11-2022

Valid till: 29-11-2025

This certificate is valid for the scope as specified in annexure for fulfilment to the requirements of NABL 128.

Clinical Laboratory, Central Ayurveda Research Institute, Bengaluru

#12, Manavarthekaval, Uttarahalli Hobli, Off Kanakapura Road, Thalghattapura post, Bengaluru, BENGALURU RURAL, Karnataka 560109, India

Signed for and on behalf of NABL



N.Venkateswaran
CEO

Glimpses of activities under CoE, CARI Blr



Diabetes OPD



Yoga classes at CARI Hospital



Exchange of MoU with IISc, Bengaluru



Exchange of MoU with CFTRI, Mysore



Patient training programme



Yoga awareness and training programmes

Student training programmes



Students visit to CARI Dry drug museum

Students visit to DSRU



Students visit to CARI Pathology laboratory



Students visit to HPTLC lab

Audience at Student training programme

Camps at various places around CARI for Diabetes screening and consultation



Medical camps conducted by CoE



Diabetes screening to patients



Free medicine distribution

E-healthcare CoE, CARI Blr

Institute's Website English Version [<http://www.cari.gov.in>]

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India will host G20 Summit In 2023 In Jammu & Kashmir

Welcome to the Central Ayurveda Research Institute, Bangalore

Ministry of AYUSH has recognised the Institute as Peripheral Pharmacovigilance centre for monitoring and reporting adverse drug reactions and misleading advertisements related to Ayurveda medicines.

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CENTRAL AYURVEDA RESEARCH INSTITUTE
CENTRAL COUNCIL FOR RESEARCH IN AYURVEDIC SCIENCES (CCRAS)
MINISTRY OF AYUSH, GOVT. OF INDIA

HOME ABOUT US DEPARTMENTS HOSPITAL CoE PHARMACOVIGILANCE GALLERY e-Consultant CONTACT

Welcome to the Central Ayurveda Research Institute, Bangalore

Central Ayurveda Research Institute Bengaluru is one of the peripheral Institutes of Central Council for Research in Ayurvedic Sciences functioning under Ministry of AYUSH Govt. of India, New Delhi. The Institute consists of three divisions (1) Clinical Research Unit (CRU) (2) Drug Standardization Research Unit (DSRU) and (3) Survey of Medicinal Plants Unit (SMPU). CARI is successfully providing OPD consultations, free Ayurveda medicines, basic diagnostics, Panchakarma, Yoga to the needy public in the hospital and through outreach camps in nearby areas. Several research studies related to common diseases including Covid 19 in addition to research in Botany are presently going on.

CARI hospital has both NABH and NABL certification awarded by Quality Council of India. In recognition of its contribution in patient care and research, the Ministry of AYUSH, Govt. of India has awarded "Centre of excellence (CoE) for research and clinical services in Madhumeha (Diabetes mellitus)".

Ministry of AYUSH has recognised the Institute as Peripheral Pharmacovigilance centre for monitoring and reporting adverse drug reactions and misleading advertisements related to Ayurveda medicines.

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ಕಾರಿ ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಸಾರ್ವಜನಿಕರಿಗಾಗಿ ದಿನಾಂಕ 9 ರಿಂದ ಮಧ್ಯಾಹ್ನ 1 ರವರೆಗೆ (ಶುಕ್ರವಾರಗಳನ್ನು ಹೊರತುಪಡಿಸಿ) ವೈದ್ಯಕೀಯ ಸೇವೆಗಳನ್ನು ಉಚಿತವಾಗಿ ಅಥವಾ ಸರ್ಕಾರಿ ನಿರ್ದೇಶನದಂತೆ ಶುಲ್ಕವಿಲ್ಲದಂತೆ ನೀಡಲಾಗುತ್ತದೆ.

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Exam cancellation notice
Invitation of Quotations for lab investigation at CARI, Bengaluru

Tender Date Extension Notice & corrigendum

VACANCIES RESULTS

RARI Goa interview. Advertisement for Walk-in Interview for the posts of SRF and Pharmacist at GOA. Advertisement of Direct

MoU between CARI, Bengaluru & CFTRI, Mysore **New!**
MoU between Indian Institute of Science (IISc), Bengaluru & CCRAS **New!**
Central Ayurveda Research Institute Brochure **New!**

Central Ayurveda Research Institute

#12, Uttarahalli Manavarthe kaval, Uttarahalli, Hobli, Kanakpura Main Road, Valley School Road, Talaghattapura post, Bengaluru, Karnataka - 560109

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related to Ayurveda medicines.



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MESSAGE FROM CARI

Clinical services are provided in CARI for free of cost or nominal charge for the needy public from 9 am to 5 pm (except holidays). Experienced Ayurveda physicians, Ayurvedic Medicines, laboratory investigations, Panchakarma and Yoga facilities are available in the hospital. The areas of strength of Ayurveda are mainly joint pain, diabetes, backache, neurological problems, chronic pain, gastro-intestinal problems, skin diseases, women's health problems.

28 beds inpatient section is opening soon. Public may avail this facility.

UPDATES FROM CARI

MoU between Indian Institute of Science (IISc), Bengaluru & CCRAS **New!**
Central Ayurveda Research Institute Brochure **New!**
Patients Rights and Education **New!**
Scope of Services **New!**
Azadi Ka Amrit Mahosav-request for public participation
AYU Raksha Kit Brochure
Ayush 64 Brochure
Cross Referral Approach Ay and modern medicine

NOTIFICATION FROM CARI

Invitation of Quotations for disposal of unserviceable items at CARI Bengaluru

Tender **New!**

Combined recruitment cancellation notification.

VACANCIES RESULTS

Advertisement for Walk-in Interview for the various posts at CARI, Bengaluru.

cari.gov.in/PDF/Advt_CARI_Bengaluru_14.07.2022.pdf

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भारत सरकार, आयुष मंत्रालय

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आयुष मंत्रालय ने आयुर्वेद दवाओं से संबंधित प्रतिकूल दवा प्रतिक्रियाओं और धमक विज्ञापनों की निगरानी और रिपोर्टिंग के लिए संस्थान को पेरिफेरल फार्माकोविजिलेंस सेंटर के रूप में मान्यता दी है।

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सी.ए.आर.आई. से संदेश

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सी.ए.आर.आई. से अद्यतन

केन्द्रीय आयुर्वेद अनुसंधान संस्थान और सीएसआईआर, केन्द्रीय खाद्य औद्योगिकी अनुसंधान संस्थान (सीएफटीआरआई) मैसूर के बीच समझौता ज्ञापन New! भारतीय विज्ञान संस्थान (IISc), बैंगलूरु और CCRAS के बीच समझौता ज्ञापन New! केन्द्रीय आयुर्वेद अनुसंधान संस्थान विवरणिका New! रूग्णों के अधिकार और शिक्षा के बारे में New! संस्थान की और से प्रदान की जाने वाली सेवाएं New! आजादी का अमृत महोत्सव- जनभागीदारी का अनुरोध आयु रक्षा किट विवरणिका

सी.ए.आर.आई. से अधिसूचना

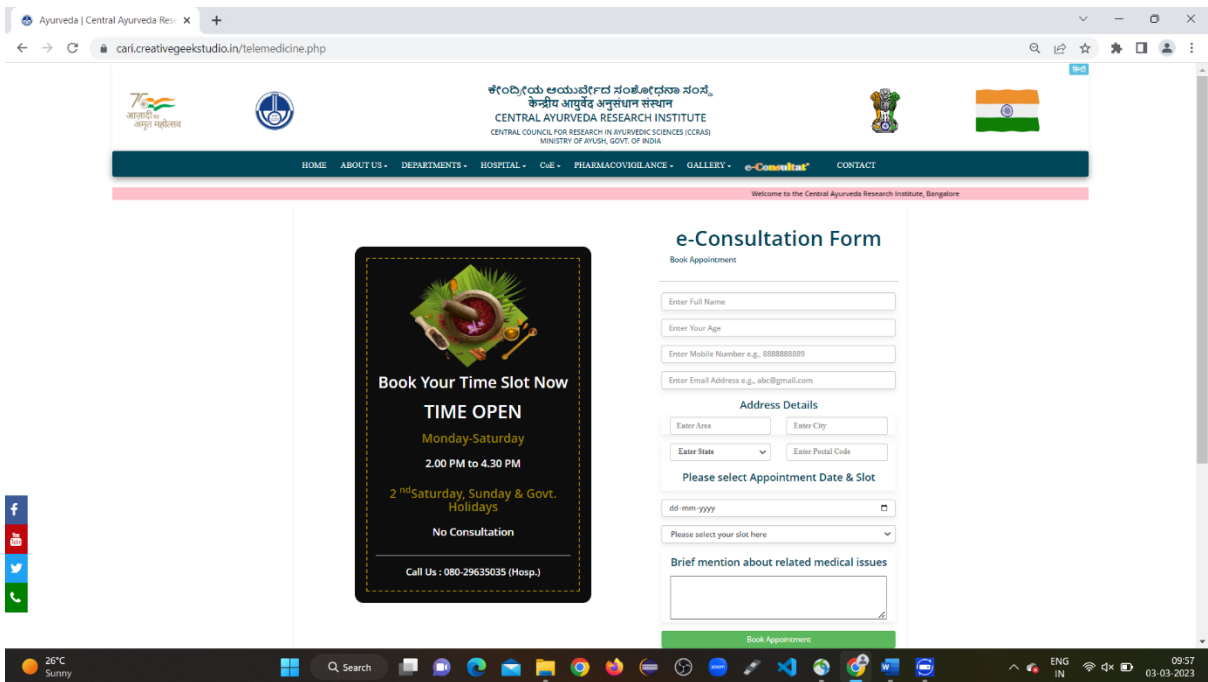
सीएसआईआई, बैंगलूरु संस्थान में कैंटीन सेवा के लिए उद्घरण हेतु निविदा निविदा New! सीएसआईआई, बैंगलूरु संस्थान में वाई-फाई लगवाने के लिए निविदा New! निगुक्तिगी परिणाम के आ.अ.सं. में विभिन्न चर्द-भर्ती के लिए प्रत्यक्ष साक्षात्कार हेतु विज्ञापन। New! आरएसआई गोवा साक्षात्कार में एसआरएफ

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Yava (Barley): A Potential Dietary Component for Management of Metabolic Disorders W.S.R. To Diabetes Mellitus-A Multi Case Report

Kavya N¹, Amulya Kannan², Monica KP³, Sulochana Bhat⁴

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ABSTRACT: *Yava* or Barley (*Hordeum vulgare* L.) of Triticaceae is one of the most celebrated cereals of Ayurveda. *Yava* is a *nityasevaneeya dravya* meaning, that which can be consumed on a regular basis and is conducive to health. Classically, *Yava* has been mentioned as a potent dietary component in many conditions which can now be placed under the umbrella term of metabolic disorders. Understanding the holistic potential of *yava* in addressing the pathogenesis of *prameha* is a key to develop newer dietary supplements out of it. This article explores the utility of *Yava* as a dietetic product in metabolic disorders with special reference to Diabetes mellitus. *Yava* was included in the daily diet of Diabetic patients for a period of 1 month and their blood glucose levels were assessed. It was noted that there was significant improvement in the glycemic control in selected patients of Diabetes mellitus.

KEY WORDS: *Yava*, Barley, *Prameha*, Diabetes mellitus, Ayurveda, Diet

INTRODUCTION

Barley, in Sanskrit, is called *Yava*. *Yava* is one of the oldest cereals known to and cultivated by mankind. *Yava* belongs to *Dhanya varga* and is revered in Ayurveda as one among the best *dhanyas*¹. *Yava* is classified under *Shukadhanya varga*, a group which deals with cereals² and *Madhura gana* owing to its sweet taste³. *Yava* is enumerated by Acharya Sushruta among the *Sarva prani pathya ahara varga* which are a group of food articles which are considered as compatible dietary articles to all animals⁴. The drug is included in *Svedopaga dashemani*—the drugs helpful in Sudation therapy⁵, *Shramaharani dashemani*⁶— drugs which are helpful to mitigate fatigue and *Chardinigrahana dashemani*⁷—the drugs which can control emesis. Sushruta considers *Yava* under *Vatasamshamana varga*⁸—a drug which can alleviate Vata. and Vagbhata emphasises its usage in *Asthapana Basti-Enema* therapy⁹.

Antiquity of Yava:

Yava is one cereal which has been vastly talked about in ancient literature of India since the Vedic era. Almost all the *puranas* mention about *Yava* and its various uses such as in rituals of *Yajna*, *Homa*, as a food and medicine—both internal and external. It is considered as nectar or Amruta and is counted as one among the five best oshadhis (annual plants)¹⁰.



Efficacious standalone Ayurveda treatment in management of Diabetes Mellitus - II : A Case Report

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ABSTRACT

Background: Diabetes is becoming one among the widely spread non-communicable disease across world and especially in India. *Ayurveda* treatment approach needs to be validated and documented so as to utilize its knowledge storehouse in managing this disease well. **Aim:** Standalone *Ayurveda* intervention was given to a *Prameha* (diabetic) patient and observations were recorded. **Methodology:** Medications prescribed were *Nisha-Amalaki* tablet, *Maha Vangeshvara Rasa* and *Amrutottara Kvatha*. *Amalaki Svarasa* was also included in her prescription owing to her high glucose values in blood and urine. Diet and lifestyle modifications were also advised. **Results:** The holistic *Ayurveda* treatment plan worked well to control *Prameha Samprapti* (Diabetes mellitus). Both the subjective and objective metrics improved significantly. Hunger and sleep improved. Reduced polyuria, polydipsia, and fatigue were observed. HbA1C decreased from 11.5% to 8.08%, Fasting Blood Sugar decreased from 240 mg/dl to 170 mg/dl, Post Prandial Blood Sugar decreased from 356 mg/dl to 306 mg/dl, Fasting Urine Sugar decreased from 1% to zero, and Post Prandial Urine Sugar decreased from 1.5% to 1%.

Key words: *Ayurveda*, *Prameha*, *Diabetes*

INTRODUCTION

Across the world, 537 million adults between the ages of 20 and 79 are thought to have diabetes, according to the 10th edition of the Diabetes Atlas released by the International Diabetic Federation in 2021. India has the second-highest percentage of diabetes patients between 20 to 79 years old (74.2 million).^[1]

According to study collaborators for the India State-Level Disease Burden Initiative Diabetes, the prevalence and number of diabetetic persons in India increased from 5.5% and 26.0 million in 1990 to 7.7%

and 65.0 million in 2016. The highest frequency was recorded in Tamil Nadu in 2016, followed by Kerala, Delhi, Punjab, Goa, and Karnataka.^[2]

Inspite of many researches to manage diabetes better, no hard and fool proof solution is found yet. Hence a need to explore indigenous medical science's knowledge database in managing disease similar to diabetes in their respective texts is the need of this era. *Ayurveda* is based upon principle of patient targeted treatment rather than disease specific. Thus, the intent of presenting of this case report. Standalone *Ayurveda* treatment was given to a high-risk Diabetes mellitus-II showing *Prameha* symptoms too.

CASE REPORT

Timeline

- Female, 48 years old, homemaker, hailing from rural Bengaluru, Karnataka.
- Diagnosed with high glucose values on a doctor's visit for her severe fatigue complaints. For two years the patient had not taken any medicines, assuming it can be controlled with diet.

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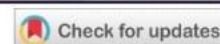
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(REVIEW ARTICLE)



Ayurveda single drug therapy for Prameha in Nighantu Sahitya: A review

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Abstract

Diabetes is one of the most rapidly increasing diseases in the contemporary context. Its swift global raise indicates that its causes are possibly closely associated with lifestyle and eating habits in the general population. The handling of Diabetes is majorly management and not curative in nature. Understanding the management of diabetes, so far, has not been very promising either in the prevention of its incidence or its complications.

The science of Ayurveda provides a huge repertoire of anti-diabetic drugs which needs further exploration. The descriptions of *Prameha vis-à-vis* Diabetes mellitus and its treatment are scattered in different classics of Ayurveda. This is an attempt to compile the information available from *Nighantu Sahitya* (the section of Ayurveda literature that predominantly deals with drugs, their morphology, properties, and actions) for documenting single drugs mentioned for *Prameha Roga* (mostly correlated to Diabetes Mellitus) and their potential in handling the disease. A total of 142 plant sourced drugs with *Pramehahara* activity enlisted from 12 *Nighantus* are included here. The paper accentuates the recognized sources of those single drugs, the botanical classification and their anti-diabetic potential. On observation, the members of Fabaceae were found to be most frequent in occurrence and hence has been a prime focus in this paper. A primary glance showed many drugs that are not in wide use for *Prameha* are enlisted here thus opening newer arenas for Diabetic research and clinical practice.

Keywords: *Prameha*; Ayurveda; *Nighantu*; Diabetes; Fabaceae

1. Introduction

Nighantu sahitya forms a major portion of all the classical Ayurveda literature specially pertaining to the aspects of *Dravyaguna*. Most of the *Nighantus* available, dating from the ancient ones to the recent 20th Cen. works, authors provide detailed information about individual drugs, their properties and actions. A cursory glance at *Nighantu* sahitya provides immense information about different drugs that can be utilised in the treatment of various diseased conditions effectively. The ancient *Nighantus* were actually *Kosas*, containing the synonyms and word meanings of names of *Dravyas*. Later *Nighantus* started giving details about the drugs along with synonyms such as description of properties, action and their uses in different diseases¹.

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Case Study

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A CASE STUDY ON AMALAKI SVARASA (*PHYLLANTHUS EMBLICA*): A POTENTIAL SINGLE DRUG INTERVENTION IN MANAGEMENT OF PRAMEHA (DIABETES MELLITUS)

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ABSTRACT

Diabetes is becoming a major health problem, approaching epidemic proportions. Rich medicinal plants have been recognized and documented in Ayurveda texts in the management of prameha (Diabetes mellitus); one among the most appreciated is Amalaki - Indian gooseberry or Amla, also known as *Phyllanthus emblica* Linn. (Syn. *Embolica officinalis* Gaertn.), belonging to the family Euphorbiaceae. Amalaki svarasa (juice of amla) was given for one month to a diabetic patient with high glucose levels and exhibited significant results in decreasing blood glucose levels and significant relief in symptoms like fatigue, burning sensation in feet, giddiness, headache, pain below the knees and excessive thirst. Fasting Blood Sugar before treatment was 375 mg/dl and 281 mg/dl after treatment. Postprandial Blood Sugar was 535 mg/dl and 382 mg/dl after treatment. Though several pharmacological studies and few clinical studies have already been done regarding diabetes prevention with this drug, there is still enough scope for re-validating its therapeutic application with its authentic Ayurveda indications and comprehensions.

Keywords: Ayurveda, Prameha, Diabetes mellitus, Amalaki, *Phyllanthus emblica*

INTRODUCTION

Amalaki means that which possesses every possible best quality within. It is famously known as 'Dhatri' in Ayurveda texts, which means "a mother"¹. Truly, this drug deserves this nomenclature as it has excellent restorative properties that invigorate body-sense-mind. Ayurveda is a time-tested medical system which approaches the treatment of diabetes in a holistic method involving medical interventions, lifestyle modifications and diet.

Prevalence of diabetes stands at approximately 537 million adults (20-79 years) as reported by the IDF Diabetes atlas. The total number of people living with diabetes is projected to rise to 643 million by 2030 and 783 million by 2045. Over 3 in 4 adults with diabetes live in low and middle-income countries. The prevalence of diabetes in 2021 is 8.3% in India².

World health organization started promoting traditional medicine interventions, and many initiatives are being carried out to increase global acceptance of Ayurveda³. Botanical therapy has been the most studied treatment in the Ayurveda system of medicine. Herbs are studied either singly or as formulas containing multiple herbs and minerals⁴. The top 10 plants used in the Ayurvedic treatment of type 2 diabetes are Bitter guard, Fenugreek, Indian Kino Tree, Gymnema, Turmeric, Tinospora, Margosa Tree, Holy Fruit Tree, Ivy Guard, and Pomegranate⁵. A much-vexed question remains whether these drugs were selected for clinical interventions due to frequent mentioning in Ayurveda texts or popularising by pharmaceutical and modern pharmacological lab studies. In an eagerness to popularise Ayurveda's clinical practice at a global level and to obtain scientific credibility, Ayurveda diagnosis and treatment in its entirety is not being adopted. Ayurveda intervention is assessed

through the framework of modern medical science, which only partially supports the understanding of a disease and its treatment in this medical science.

Amalaki svarasa (juice extract of *Phyllanthus emblica* fruits) has been mentioned as single drug therapy in the management of prameha (Diabetes mellitus)⁶⁻⁸. Amalaki svarasa exhibited significant improvements in the management of prameha, hence the motive to present this case study.

Case Report

Female, 53 years old, homemaker, widowed, hailing from Kolhapur, K/C/O DM, since 2011, got to know on a general health check-up in their village. She was advised to start on insulin injections from August 2021 due to increased glucose levels in lab investigations. (FBS – 240, PPBS – 359). Due to the incompatibility of allopathic medicines with gut-related problems, family-influenced emotional issues and financial constraints, she stopped taking any medicines for Diabetes mellitus in October 2021 as per her free will. Due to the sudden stoppage of all interventions, the patient became debilitated and shifted to Bengaluru (family home) in November 2021. Approached our hospital on 27/12/2021 to avail of free Ayurveda treatment for already diagnosed DM. The patient was on a vegetarian diet and could manage minimum daily activities.

After around fifteen days of Ayurveda intervention consisting of Nishamalaki tablets, Ashvagandha tablets, Kataka Khadiradi Kashaya, and Amrutadi taila for pada-abhyaṅga, the patient did not show significant improvement. During the first follow-up, lab investigations were done on 10/01/2022. Blood and urine glucose was high. Amalaki svarasa intervention was started on 22/01/2022 to 22/02/2022, along with previous Ayurveda

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A narrative literary review on design of anti-diabetic (*Prameha*) formulations from various *Ayurveda* treatises

Amulya Kannan, Raghavendra Naik, Kavya N., Monica K. P, Sulochana Bhat

Abstract

Ayurveda texts spanning from 100 BC to 18th AD, which have not been frequently scrutinised for management of *Prameha* (Diabetes mellitus) have been selected. This review is expected to enrich the documentary evidences about classical references on formulations related to *Prameha* (Diabetes mellitus) as add on to future researches. A total of 524 formulations out of 15 *Ayurveda* texts have been considered to observe drug design methods in this review paper. Formulations with *Phalashruti* (verse with indications) of "*Prameha*" were scrutinised. The preliminary data was categorised based on their dosage forms, indications of formulations in accordance to *Doshas* (regulatory functional factors of the body), adjuvants etc and the result have been substantiated. Drugs and formulations most enumerated amongst these 15 texts have been presented. *Kwatha* (decoction) is most enumerated dosage form (241 formulations). Honey is most enumerated adjuvant (172 formulations). *Nyagrodadhi gana* (*kwatha* or *churna*) and *Dhanvantara ghrita* were the most frequently mentioned formulation. *Triphala* was the most enlisted drug amongst 323 formulations (in formulation with less than 10 ingredients). *Vidanga* (*Embelia ribes* Burm.f.), *Arjuna* (*Terminalia arjuna* (Roxb.) Wight and Arn.) *Patha* (*Cissampelos pareira* L.) were most repeated drugs indicated in *Kaphaja Prameha*, *Pittaja Prameha* and *Vataja Prameha* respectively (in formulation with less than 10 ingredients). This review gives comprehensive detail related to formulations indicated in *Prameha* (Diabetes mellitus) compiled from 15 *Ayurveda* treatises.

Keywords:

Ayurveda, diabetes mellitus, formulations, *Prameha*

Introduction

The International Diabetes Federation's 10th edition of Diabetes atlas estimated that approximately 537 million adults aged 20–79 years are living with diabetes.^[1] The prevalence of diabetes in India has remained at 11.8% in the last four years, according to the National Diabetes and Diabetic Retinopathy Survey (2015–2019) report released by the Ministry of Health and Family Welfare.^[2] Thus a shift in currently practised methodology of generalised treatment to personalised treatment is needed to cater such huge needs in management of

diabetes. *Ayurveda*, with such vast database of drugs and formulations whence validated scientifically may hold the key to this problem. Currently available therapies for diabetes include insulin and oral antidiabetic agents such as sulfonylureas, biguanides, glinides etc. Many of them have a number of serious adverse effects; therefore, the search for more effective and safer hypoglycaemic agents is one of the important areas of investigation.^[3] *Ayurveda* drug database when validated scientifically may help in management of Diabetes holistically. *Ayurveda* documentation in the form of scriptures has transpired over many centuries. Depending on its era, prevalent treatment practises and personal interest

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The Practice of Yoga and Ayurveda in the Management of Anxiety, Hypertension and Diabetes Mellitus.

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ABSTRACT:

Ayurveda is a comprehensive system that concentrates on repeated consciousness. Hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure. It stands to be the most focused disease due to its high mortality rate. Diabetes is a metabolic disorder that stands second to hypertension as a great concern repeated yoga practice and following Ayurveda together show wonderful results in treating various diseases. And this technique can help with long-term stress or stress related to various health problems such as heart disease. Relaxation techniques are a great way to help with stress management. It's the process that decreases the stress effects on your mind and body. Yoga, a form of physical activity, is rapidly gaining in popularity and has many health benefits. In this study, the effect of yoga therapy, and how it worked in controlling hypertension immediately after the Deep Relaxation Technique (DRT) and Ayurveda medicines on Hypertension (HTN) and Diabetes Mellitus (DM) have been discussed.

Keywords-Diabetes, Hypertension, Ayurveda, Stress, Deep Relaxation Technique, Yoga therapy.

INTRODUCTION

Ayurveda has been a traditional health care system of Indian medicine since ancient times, it's also called as science of life and is considered *Upa Veda of Atharva Veda*.¹ Ayurveda explains the basic and applied aspects of life. It offers a balanced and holistic approach to treating various diseases.²

Diabetes is a chronic, metabolic and lifestyle disease characterized by elevated levels of blood glucose (or blood sugar). Diabetes occurs either when the pancreas does not

produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood glucose. Hyperglycaemia, also called raised blood glucose or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. And damage to the heart, blood vessels, eyes, kidneys, and nerves. The most common is type 2 diabetes, usually in adults, which occurs



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