



## COMPARATIVE STUDY OF EFFECT OF CHAIN YOGIC EXERCISE (YOGASANA) AND YOGIC THERAPY (AGNISAR KRIYA) FOR REHABILITATION OF TYPE 2 DIABETES MELLITUS (T2D)

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### Abstract:

The motive of this study was to find out the effect of Chain Yogic Exercise (Yogasana), Yogic Therapy (Agnisar Kriya) on Diabetes Mellitus (T2D). For the purpose of this study 200 subjects were selected and divided into two groups from Delhi, India. Both groups are experimental groups. In each group, 100:100 Type 2 Diabetes Mellitus (T2DM) subjects were distributed. There were 50 females and 50 males in each group i.e. half of the each group was female. The subjects' age ranged between 35-45 years. One group was engaged in Chain Yogic Exercise (Yogasana) and the other group was perform Yogic Therapy (Agnisar Kriya), This process was for 90 days (30-30-30 days). The data was collected on the first day (dated 16<sup>th</sup> September 2020) of 1<sup>st</sup> round as pre-test and on the last day (dated 16<sup>th</sup> October 2020) of 1<sup>st</sup> round as post-test. For statistical analysis and interpretation of data, paired t-Test was employed. The level of significance had been taken 0.05 and 0.01. The study found Chain Yogic Exercise (Yogasana), Yogic Therapy (Agnisar Kriya) both has a significant effect to control Diabetes Mellitus (T2D). The study also found that Yogic Therapy (Agnisar Kriya) had much better effect to control Diabetes Mellitus (T2D) than Chain Yogic Exercise (Yogasana).

**Keywords:** Chain Yogic Exercise (Yogasana), Yogic Therapy (Agnisar Kriya), Diabetes Mellitus (T2D)

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## 1. Introduction

Man is in constant search for health, happiness and peace, because health is the key to success and salvation. The purpose of practicing yoga is to harmonize the body, mind and soul so that they function in full form. Diabetes is considering a slow killer affecting the majority of the population in different age groups in the world. This is seed more in the civilized society. This is due to modernization, fast life, stressful life, inappropriate diet, weak and imbalanced metabolism etc. Squall Yogasanas called Chain Yogic Exercise (Yogasana). In the other way we can say the loop of the yogasans called Chain Yogasans. Anyone doing Yogasanas 'one by one' in a 'continual flow' or 'rhythm'; specified or recommended by the experts called Chain Yogic Exercise (Yogasana). Yogic Therapy (Agnisar Kriya) is a technique of Yoga Cleaning (Part of Shatkarma) which is believed to clear the chakra of manipura (navel) as well as strengthen the muscles of the abdomen and boost digestion. The Sanskrit name comes from agni, meaning 'fire'; sar, meaning 'essence'; and kriya, meaning 'action'. Type 2 diabetes (T2D) starts with insulin resistance, a disorder in which cells fail to respond properly to insulin. A lack of insulin can also evolve as the illness progresses. Previously, this type was referred to as "non-insulin dependent diabetes mellitus" (NIDDM) or 'adult-onset diabetes'. A combination of excessive body weight and inadequate exercise is the most common cause. *"Better health is central to human happiness and well-being"* [1] (Hande Genc, 2018). *"It also makes an important contribution to economic progress, as healthy populations live longer, are more productive, and save more"* (Mahaveer Golechha, 2015) [2]. Many variables affect health status and a nation's capability to provide best health services for its citizens. *"Health ministries are playing an important character and other governmental departments, civil society's groups, NGOs, donor organizations and social bodies themselves"* [3].

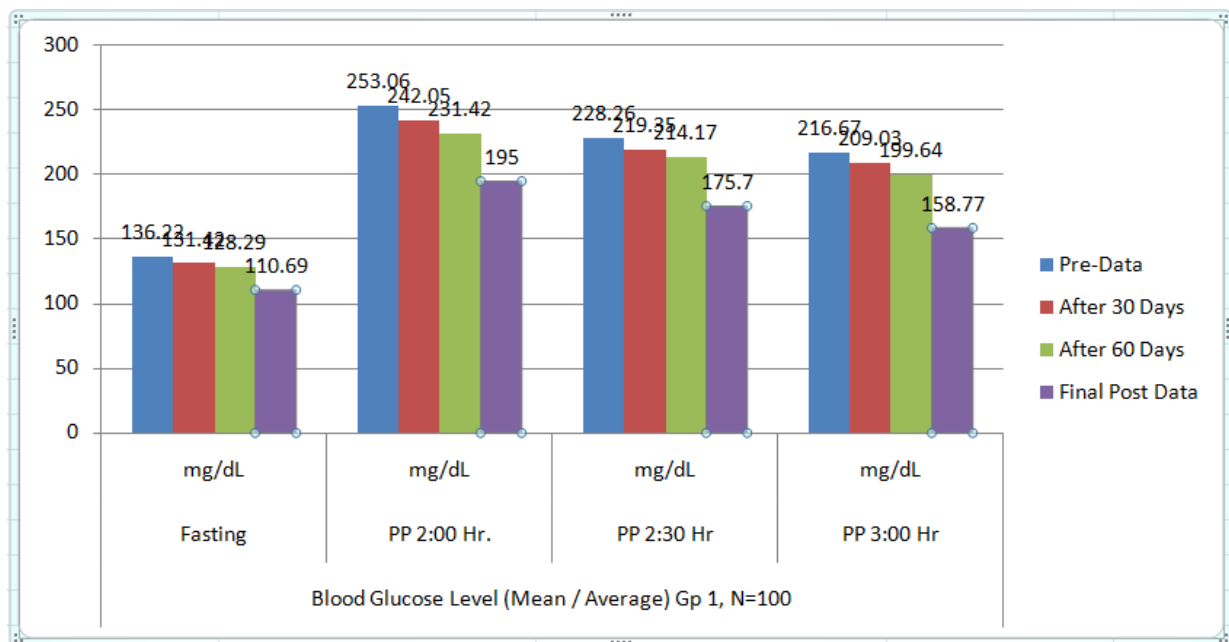
## 2. Methods

For the purpose of this study 200 subjects were selected and divided into two groups from Delhi, India. Both groups were experimental groups. In each group, 100:100 Type 2 Diabetes Mellitus (T2DM) subjects were distributed. There were 50 females and 50 males in each group i.e. half of the each group was female. The subjects' age ranged between 35-45 years. One group was engaged in Chain Yogic Exercise (Yogasana) and the other group was perform Yogic Therapy (Agnisar Kriya), this process was for 90 days (30-30-30 days). The data was collected on the first day (dated 16<sup>th</sup> September 2020) of 1<sup>st</sup> round as pre-test and on the last day (dated 16<sup>th</sup> October 2020) of 1<sup>st</sup> round as post-test. The post-test data of 1<sup>st</sup> round was the pre-test data for 2<sup>nd</sup> round. Blood Sugar Level and general well-being samples have been taken before starting the experiment, which called pre-test data. After 30 days of practice, blood sugar level and well-being facts have been taken again, which called post-test data for pre-test and post-test data such a way will proceed for the next 30 days (30:30:30 days). For statistical analysis and interpretation of data, paired t-Test was employed. The level of significance had been taken 0.05 and 0.01.

### 3. Results

**Table 1:** Comparing Mean Data BGL (Blood Glucose Level) of Group One

Sr. No.	Data Collection Frequency	Blood Glucose Level (Mean / Average) Gp 1, N=100			
		Fasting mg/dL	PP 2:00 Hr. mg/dL	PP 2:30 Hr mg/dL	PP 3:00 Hr mg/dL
1	Pre-Data	136.22	253.06	228.26	216.67
2	After 30 Days	131.42	242.05	219.35	209.03
3	After 60 Days	128.29	231.42	214.17	199.64
4	Final Post Data	110.69	195.00	175.70	158.77



**Figure 1:** Comparing Average Data of BGL of Group one

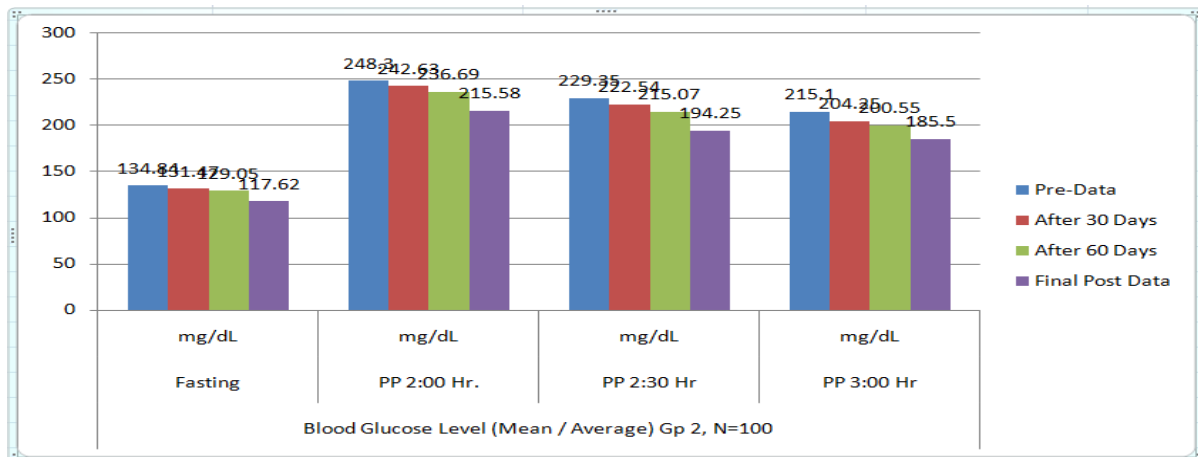
Table 1 shows that Fasting Blood Glucose Level (BGL) is continuously down i.e.  $136.22 > 131.42 > 128.29 > 110.69$ . Hence, here BGL is down 136.22 mg/dL to 110.69 mg/dL, the difference is 25.53. In percentage, we can say that 18.74% benefit by the Chain Yogic Exercise (Yogasana) to the Group one after practice of 90 days.

**Table 2:** Comparing Mean Data BGL (Blood Glucose Level) of Group 2

Sr. No.	Data Collection Frequency	Blood Glucose Level (Mean / Average) Gp 2, N=100			
		Fasting mg/dL	PP 2:00 Hr. mg/dL	PP 2:30 Hr mg/dL	PP 3:00 Hr mg/dL
1	Pre-Data	134.84	248.30	229.35	215.10
2	After 30 Days	131.47	242.63	222.54	204.25
3	After 60 Days	129.05	236.69	215.07	200.55
4	Final Post Data	117.62	215.58	194.25	185.50

Table 2 shows that Fasting Blood Glucose Level (BGL) is continuously reduce i.e.  $134.84 > 131.47 > 129.05 > 117.62$ , PP 2:00 hr Blood Glucose Level (BGL) reduces as  $248.30 > 242.63$

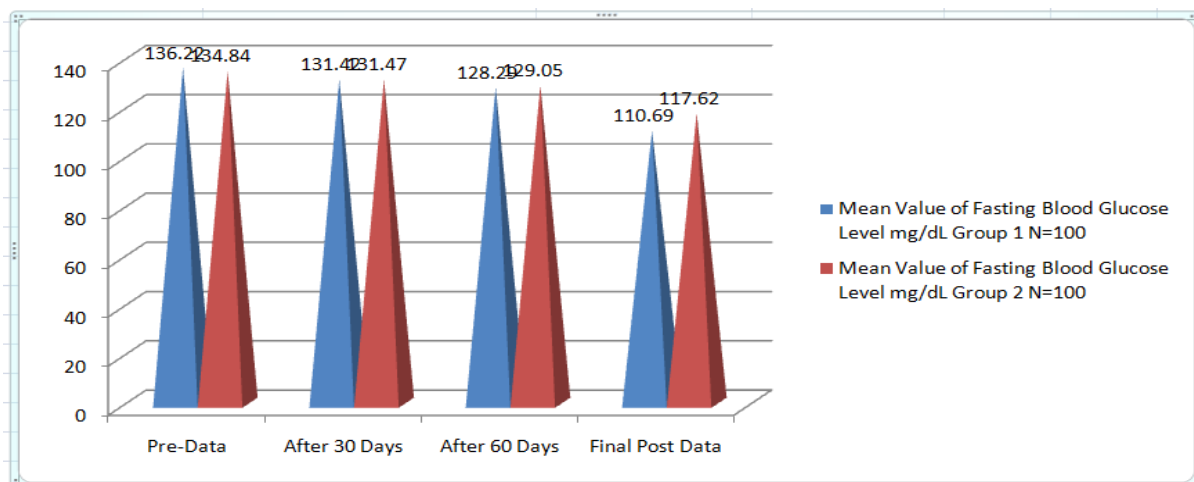
> 236.69 > 215.58 mg/dL, PP 2:30 hr Blood Glucose Level (BGL) reduces as 229.35 > 222.54 > 215.07 > 194.25, PP 3:00 hr Blood Glucose Level (BGL) reduces as 215.10 > 204.25 > 200.55 > 185.50. Hence, here BGL is down 134.84 mg/dL to 117.62 mg/dL, the difference is 17.22. In percentage, we can say that 12.77% benefit in fasting blood glucose level by the Yogic Therapy (Agnisar Kriya) to the Group two after practice of 90 days and 13.18 % benefit in PP 2:00 hr blood glucose level by the Yogic Therapy (Agnisar Kriya) to the Group two after practice of 90 days.



**Figure 2:** Comparing Average Data of BGL of Group two

**Table 3:** Fasting Blood Glucose data of both groups

Sr. No.	Data Frequency	Mean Value Fasting Blood Glucose Level mg/dL	
		Group 1	Group 2
		N=100	N=100
1	Pre-Data	136.22	134.84
2	After 30 Days	131.42	131.47
3	After 60 Days	128.29	129.05
4	Final Post Data	110.69	117.62



**Figure 3:** Mean Value Fasting Blood Glucose Level in mg/dL

**Table 4:** Fasting Blood Glucose data for t-test of both groups

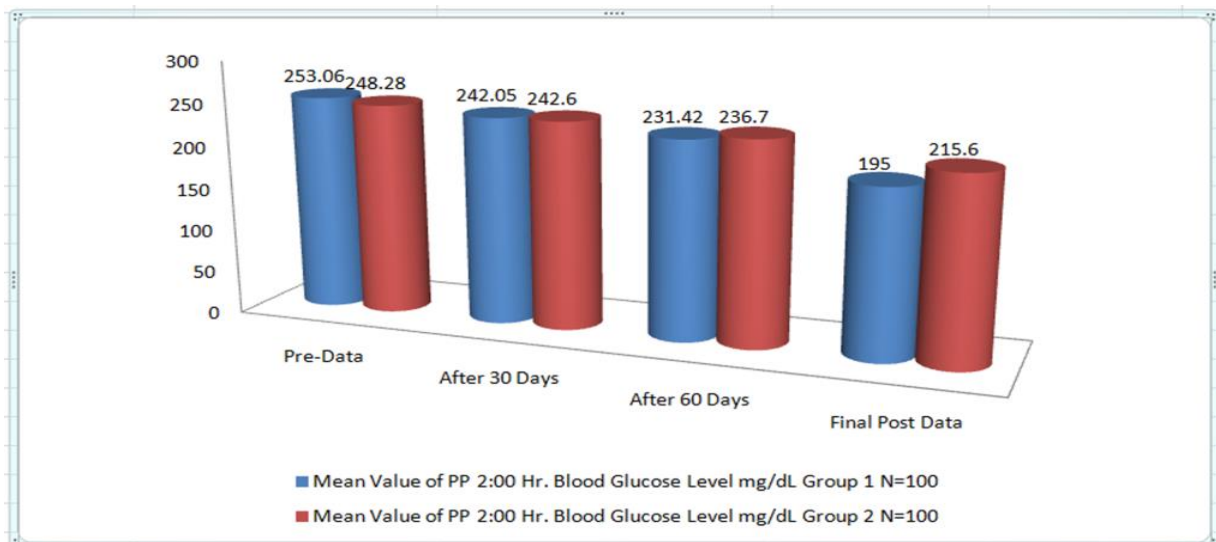
Sr. No.	Groups	Sample N	Mean of Fasting BGL mg/dL (After 90 Days)	SD	t-test	Significant Level based of 't' distribution list
1	Group 1	100	110.69	7.528659049	1.3537	Not Significant*
2	Group 2	100	117.62	9.130678668		
			$M_D = 6.93$			

\*Significant level at 0.05 level is 1.97 & at 0.01 level is 2.60.

Table 4 shows that t-test value is 1.3537, which is not greater than d.f. value of 198 in t-distribution list, at 0.05 level (value 1.97) and 0.01 level (value 2.60). So, we can say that both groups for fasting blood glucose level is not significant, this means Chain Yogic Exercise (Yogasana) and Yogic Therapy (Agnisar Kriya) both are good practices to control fasting blood glucose level.

**Table 5:** PP 2:00 hr Blood Glucose data of both groups

Sr. No.	Data Collection Frequency	Mean Value of PP 2:00 Hr. Blood Glucose Level mg/dL	
		Group 1	Group 2
		N=100	N=100
1	Pre-Data	253.06	248.28
2	After 30 Days	242.05	242.60
3	After 60 Days	231.42	236.70
4	Final Post Data	195.00	215.60



**Figure 4:** Mean Value of PP 2:00 Hr. Blood Glucose Level

**Table 6:** PP 2:00 hr. Blood Glucose data for t-test of both groups

Sr. No.	Groups	Sample N	Mean of PP 2:00 Hr BGL mg/dL (After 90 Days)	SD	t-test	Significant Level based of 't' distribution list
1	Group 1	100	195.00	29.93427143	5.034969959	Significant*
2	Group 2	100	215.60	27.89054363		
			M <sub>D</sub> = 20.6			

\*Significant level at 0.05 level is 1.97 & at 0.01 levels is 2.60.

Table 6 shows that t-test value is 5.035, which is greater than d.f. value of 198 in t-distribution list, at 0.05 level (value 1.97) and 0.01 level (value 2.60). So, we can say that both groups for PP 2:00 hr blood glucose level is significant, this means 'Yogasana' and 'Agnisar Kriya' both are good practices to controlling fasting blood glucose, but Yogic Therapy (Agnisar Kriya) had much better effect to control Diabetes Mellitus (T2D) than Chain Yogic Exercise (Yogasana).

#### 4. Conclusions

Chain Yogic Exercise (Yogasana) and Yogic Therapy (Agnisar Kriya) as the yoga intervention is very effective techniques for the T2D patients to control the Fasting & PP Blood Glucose Level with 90 days practice schedule. In both technique Yogic Therapy (Agnisar Kriya) finds better than the Chain Yogic Exercise (Yogasana) after 90 days practice. Chain Yogic Exercise (Yogasana) and Yogic Therapy (Agnisar Kriya) are very effective techniques for the T2D patients for the betterment of well-being. Hence, we conclude that Chain Yogic Exercise (Yogasana) and Yogic Therapy (Agnisar Kriya) both are good for T2D patients, when both practices continuously for long time period but Yogic Therapy (Agnisar Kriya) is very effective to control T2D.

#### Conflict of Interest Statement

The author declares no conflicts of interests.

#### About the Author

**Amit Chandra Deshmukh** was born in East Champaran, India in 1982. He is a Doctoral student in Shanghai Sports University of Sports from the Department of Sports Coaching and Training (2018-2021). He has 15 years teaching working experience, also has double master degree. Current research interest in special rehabilitation therapy for anxiety, depression & other daily life problem in sportsman and human beings.

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