

Title of the Project:
MULTICENTRIC STUDY ON THE
EFFECT OF TEA IN
CEREBROVASCULAR DISEASE AND
DIABETES

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Background:

- Tea is the most widely consumed human beverage.
- It is rich in flavonoids, which causes significant endothelium dependent vasodilatation.
- Catechins in tea are promising tool against cerebrovascular diseases and metabolic syndromes.

Background:

- The polyphenolic flavonoids in tea are thought to have a protective effect on cerebrovascular disease.
- Observational study on tea intake and stroke is found beneficial in preventing ischemic stroke.
- There is paucity of study on effects of tea on prevention of stroke in Indian subcontinent, though a sizeable population consumes tea as a premier drink.

Aims and Objectives:

- ✓ To study the effect of tea drinking in cases of proved cerebrovascular disease with or without diabetes mellitus, hypertension and ischemic heart disease

Materials & Methods:

- ❖ **Study type:** Descriptive longitudinal study
- ❖ **Duration of the study:** A total of 1100 patients with stroke were identified starting from 1st Nov 08' to 31st Dec 10
- ❖ **Sample population:** Indoor & outdoor patients of the Ramakrishna Mission Seva Pratisthan and other premier private hospitals of Kolkata

Methods cont..

❑ *Inclusion criteria:*

- Cases of clinically established Cerebrovascular disease with or without corresponding neuroimaging changes
- Age range : 40yrs to 80yrs of both sex
- With or without co-existing hypertension, diabetes mellitus and ischemic heart disease

Methods cont..

❑ Exclusion criteria:

- Patient with history of transient ischemic attack
- Patients with stroke mimickers

Methods cont..

Data Collection:

- The structured test proforma was administered by two field workers under the direct supervision of competent physician and neurologist
- All information were verified by a team consisting of senior neurologist and physician

Methods cont..

- Detailed history based on different questionnaire was taken
- Questionnaires include details of demography, dietary habit, tea intake, addictions if any other than tea, diabetes mellitus, stroke as well as calculation of Barthel Index
- Clinical examination of subjects with stroke was conducted

Methods cont..

- Blood biochemistry, neuroimaging of brain, ECG, chest X-ray were done in each case at the onset and every 6 months interval

Methods cont..

- ❖ Biochemical examination of individuals done from a standard NABL accredited laboratory included fasting and post prandial blood glucose, fasting lipid profile, blood urea and creatinine and serum uric acid.
- ❖ Subjects were instructed neither to take any other beverage, hormonal replacement therapy(in female) nor alter their usual dietary habit

Methods cont..

- Individuals stable on existing medications were advised to continue the same unless situation demands dose modification or withdrawal
- Methods of tea preparation were detailed to study participants and they were asked to take ≥ 5 cups (each cup contains 150ml of tea)

Methods cont..

- **35% of individuals** did not adhere to the strict methodology of tea preparation, type and amount of tea ingested as directed.
- At second follow up visits of 505 subjects with stroke (454-drinker and 49-non tea drinker), the incidence of repeat stroke was 19.16% in tea drinker and 38.77% in non tea-drinkers.

Statistics:

Univariate and multivariate analysis were done by professional medical statistician to reveal out the effect of tea on cerebrovascular disease.

Results & Analysis:

- Out of 1100 participants, 787 were male and 313 were female.
- The age range of individuals was 40-80 yrs with a mean 61.62
- At second follow up , 505 cases were regular and 398 cases were erratic in attendance
- 161 subjects were lost, 27 were migrated and 9 died

Results & Analysis:

- The mean SBP at the onset of study was 150 ± 5.6
- The mean DBP at the onset of study was 98 ± 6.4
- The mean SBP at the end of second follow up was 148 ± 4.2
- The mean DBP at the end of second follow up was 92 ± 3.8

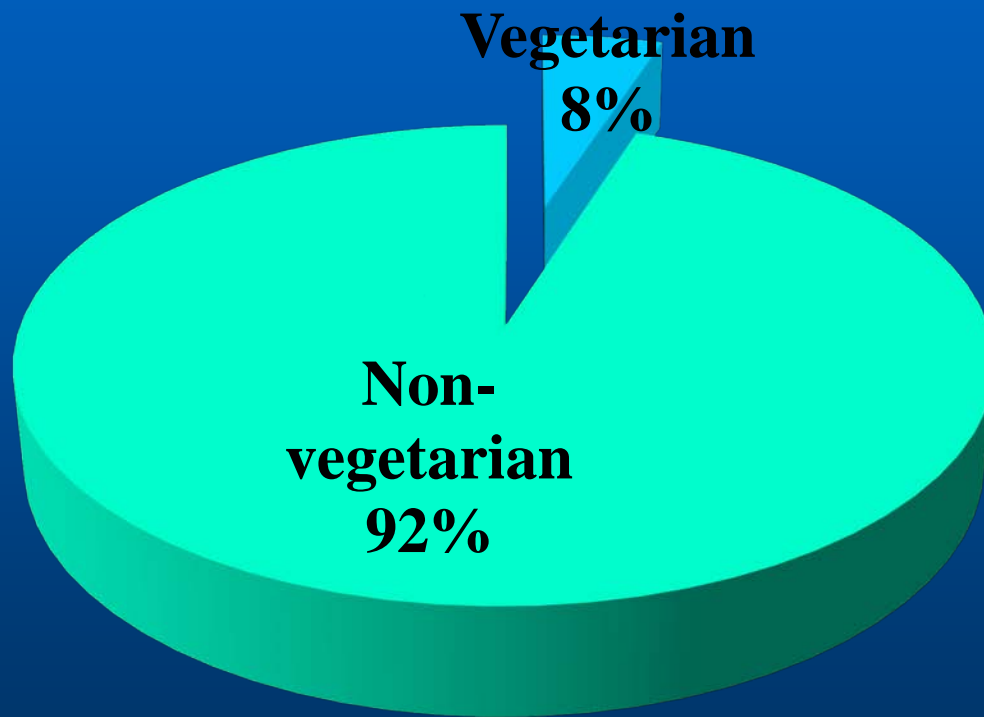
Table-1 Age distribution of the enrolled patients:

Age Range	Male	Female	Total
40-50 yrs	221	57	278
50-75 yrs	424	211	635
75 yrs & above	95	92	187

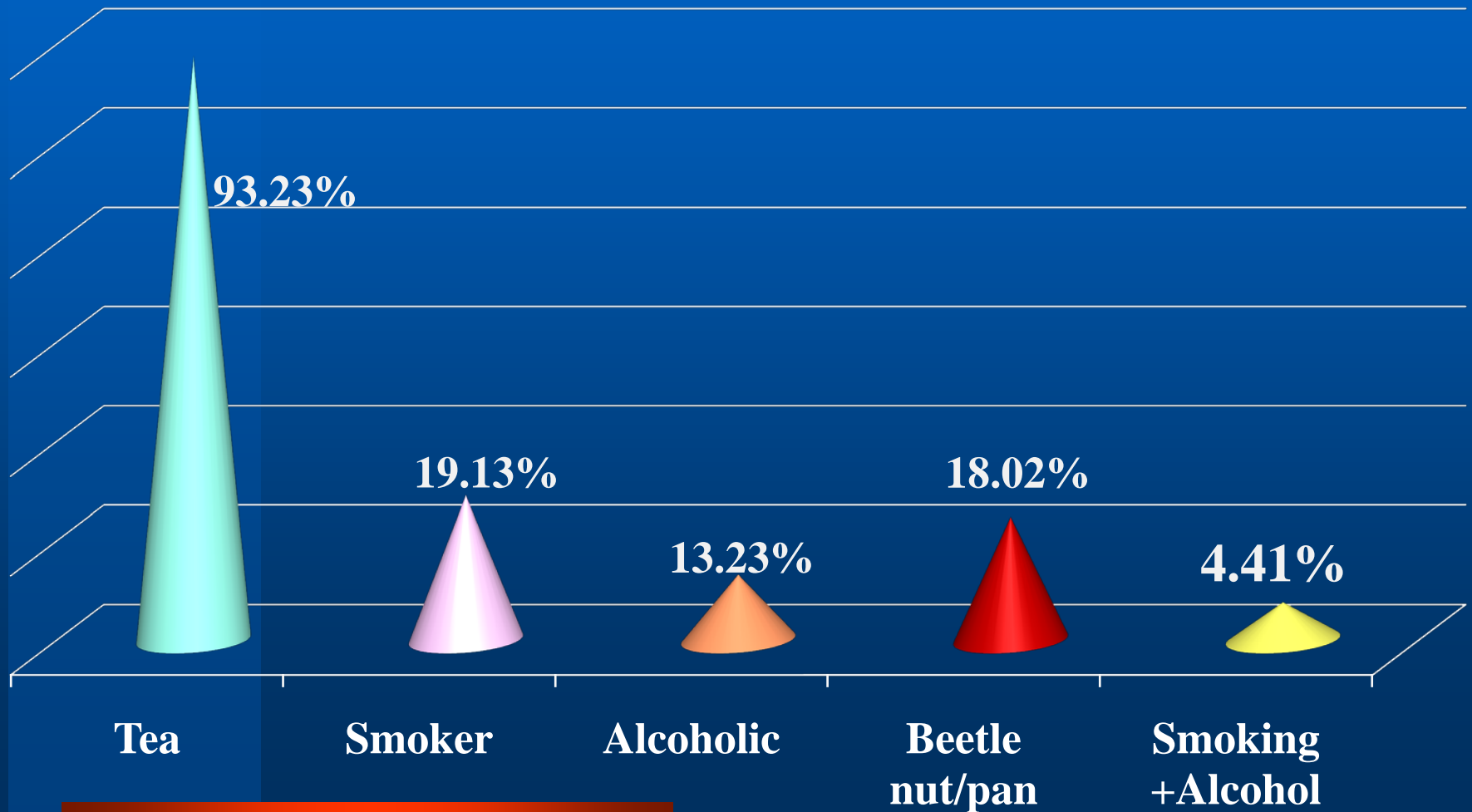
Table-2 Second Follow up of patients (N=505) :

Tea drinker (n=456)		Non tea drinker (n=49)	Death statistics among patients under surveillance (n=9)	Patients died due to repeat attacks
Tea consumption (cups/day)	No. of patients with repeat attacks	19 non tea drinker have a history of repeated attacks	Non tea drinker	3
Up to 3 cups	57		Up to 3 cups	5
4-5 cups	24		4-5 cups	1
>5 cups	6		>5 cups	0
Total	19.16%	38.77%	Total	9

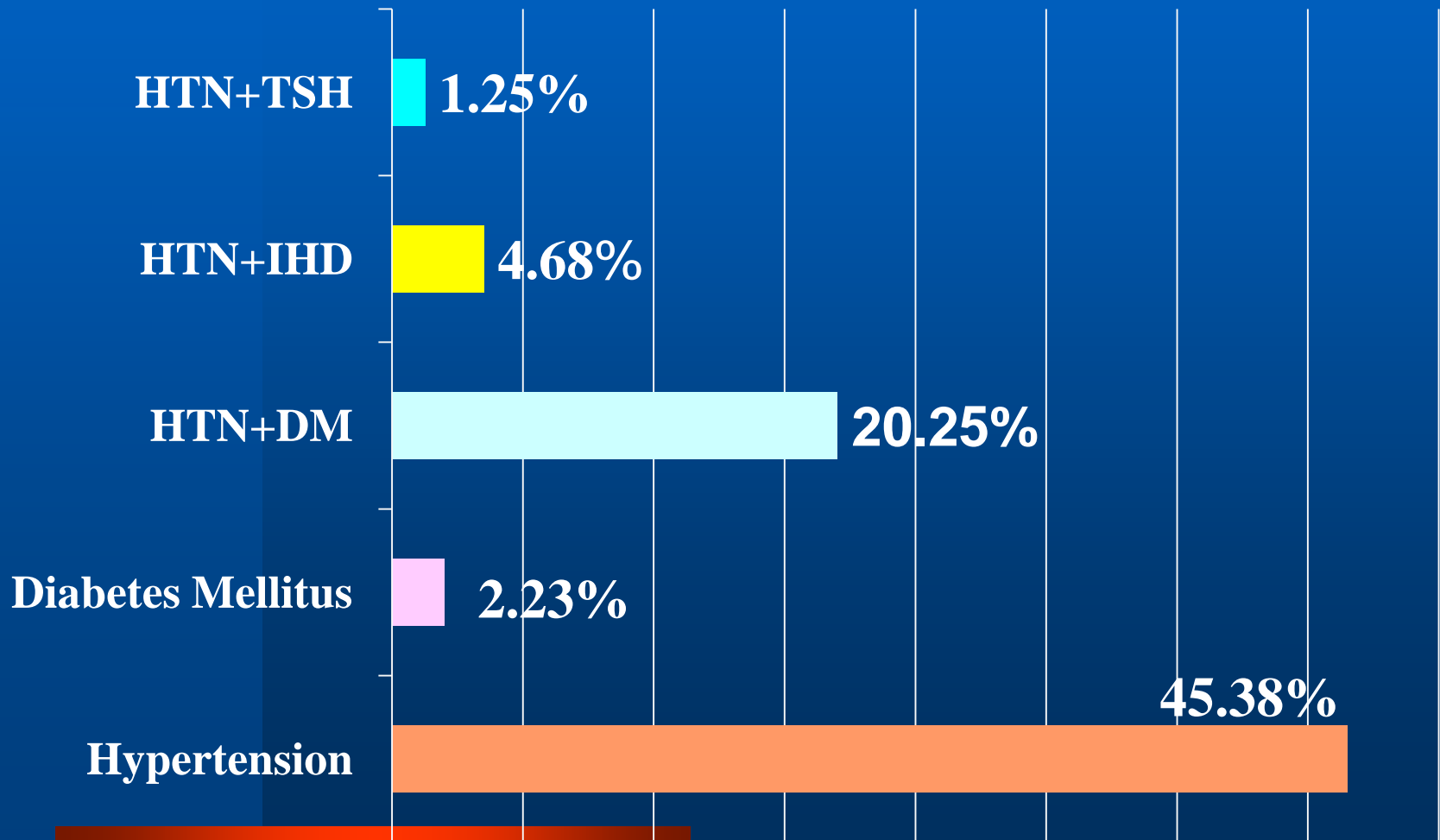
Dietary Habit of 1100 stroke patients:



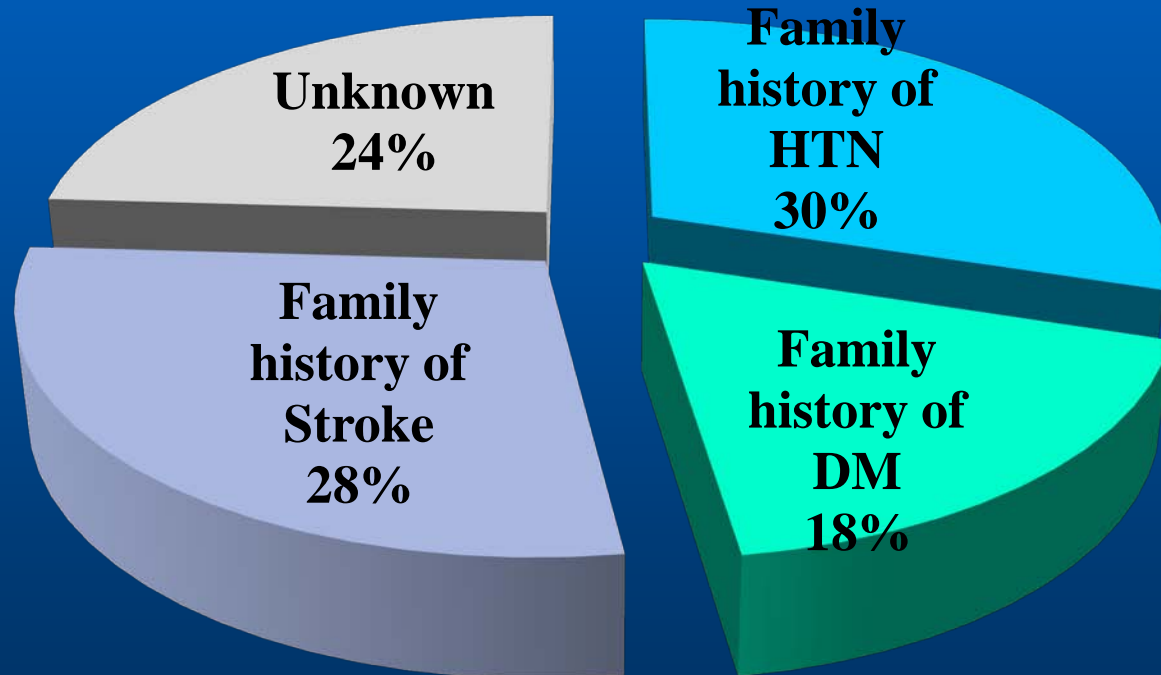
Types of Addiction:



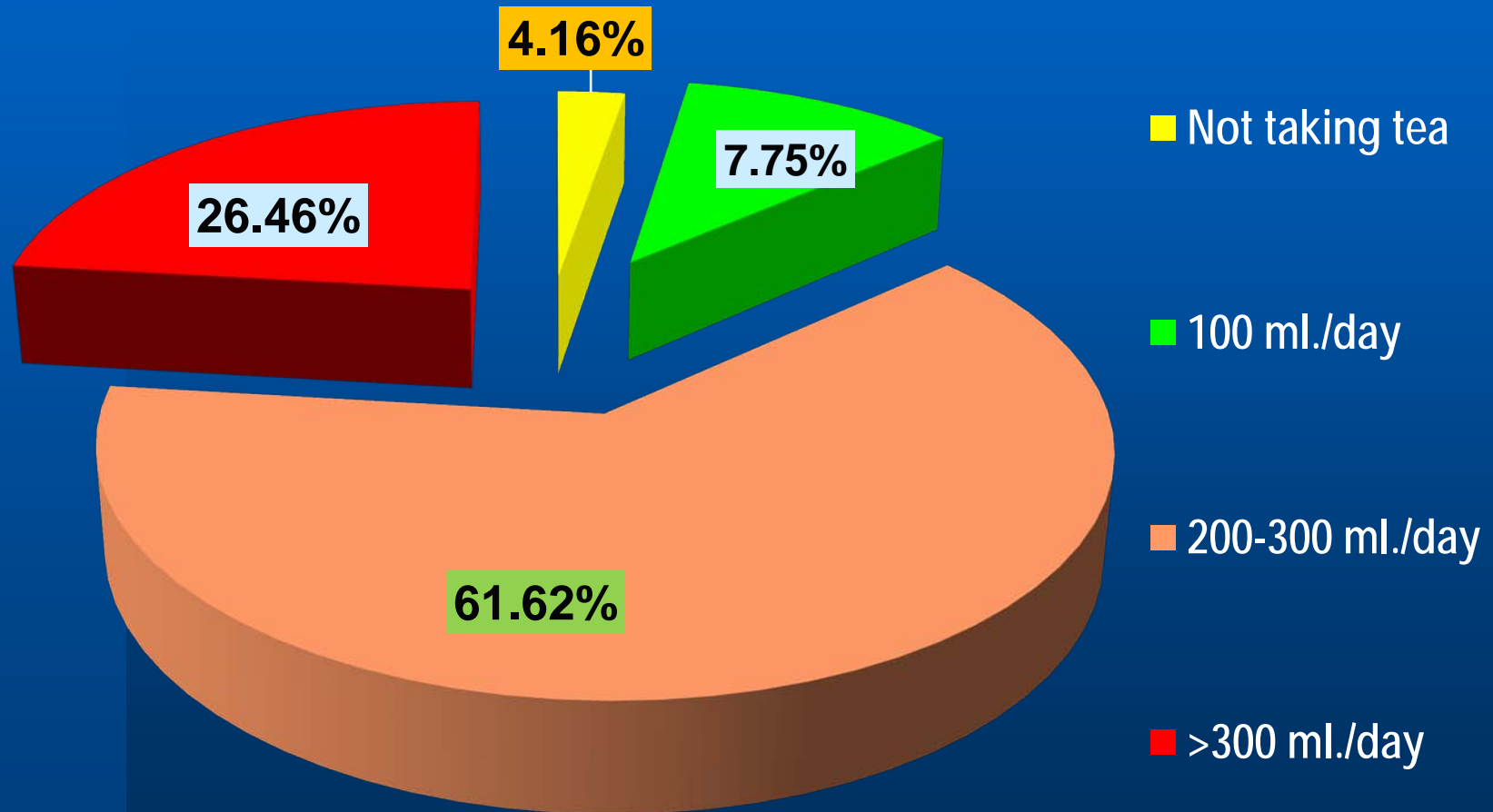
Patients having following illness prior to the onset of stroke:



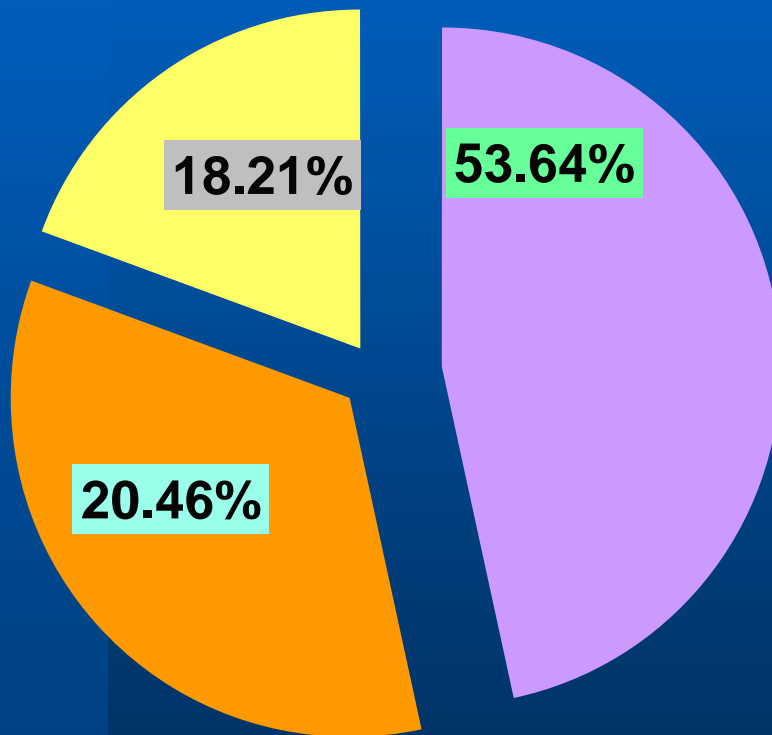
Family History:



Quantity of tea intake among subjects:



Tea drinking types:



■ Only Decoction

■ With milk & sugar

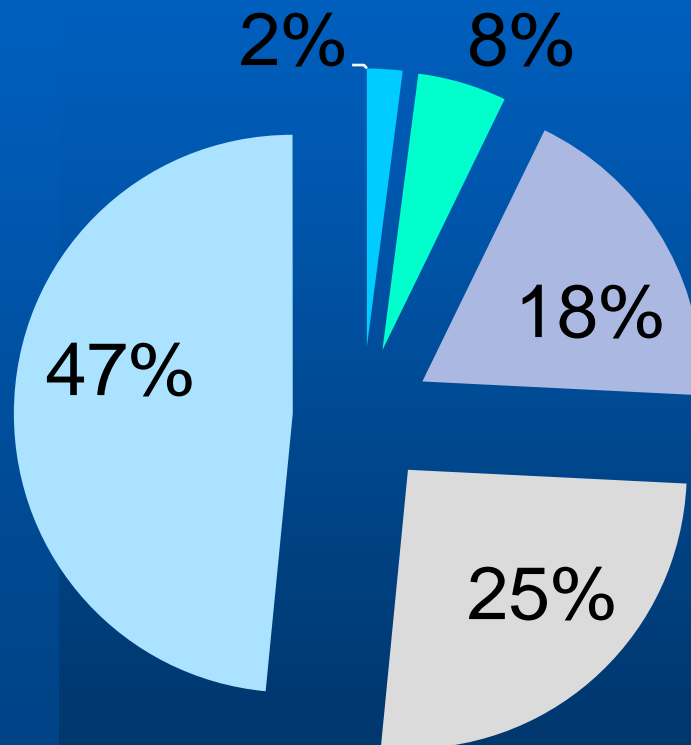
■ Without milk but with sugar / with milk but no sugar

Table-4. Comparison between first and second visits by Paired t test :

	Mean	Std.Dv	Diff.	Std.Dv	t	df	p
FBS	106.21	17.95					
FBS_2	102.86	16.78	3.34	7.11	2.25	22	*0.03
LDL	115.6	45.65					
LDL_2	110.92	40.37	4.68	31.07	0.75	24	*0.45

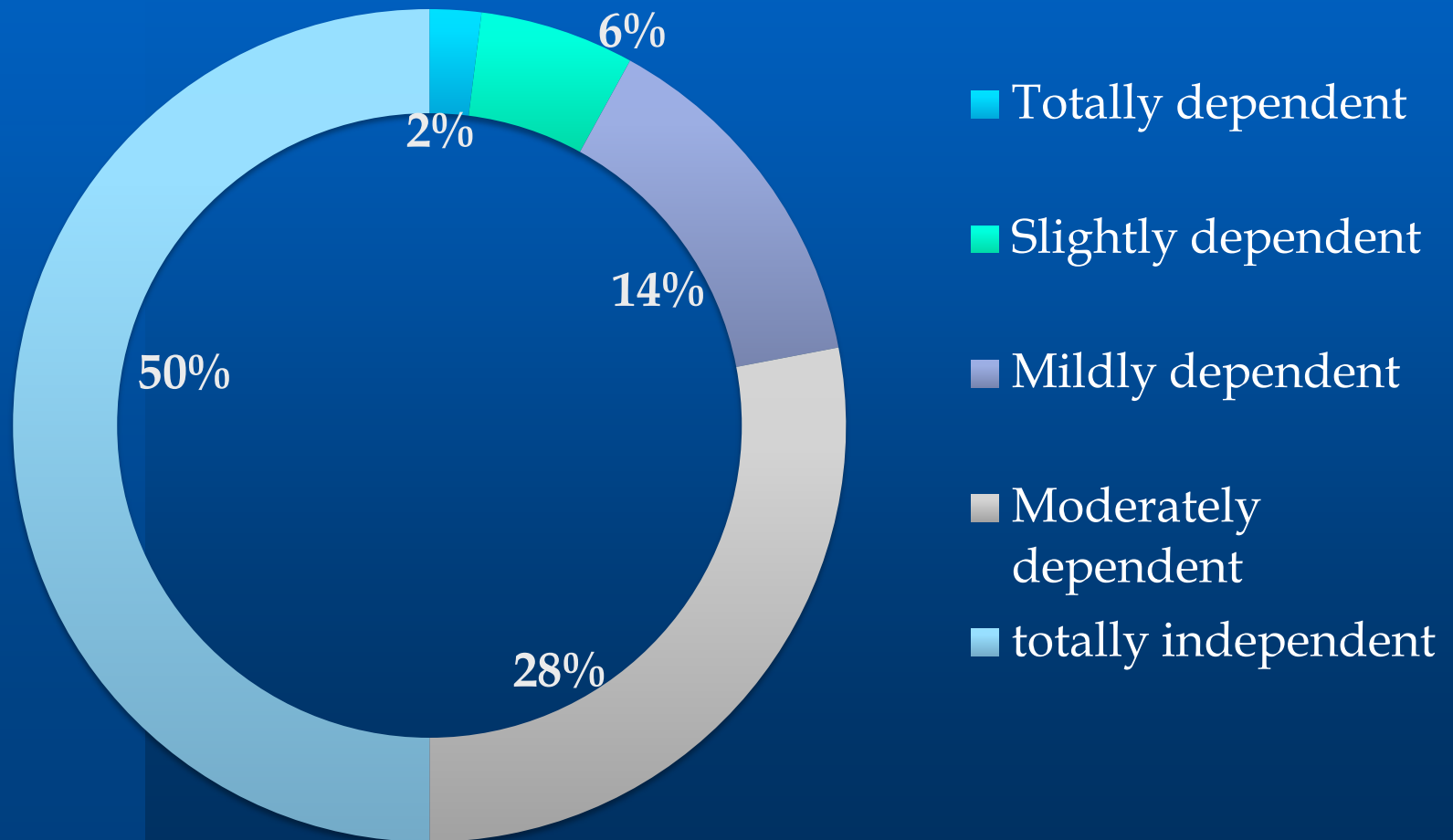
*Level of significance $p \leq 0.01$

Barthel Index: (1st visit)



- Totally dependent
- Slightly dependent
- Mildly dependent
- Moderately dependent
- Totally independent

Barthel Index: (2nd visit)



Conclusion:

- ❑ Our observation revealed tea consumption of 450 ml or more (≥ 3 cups)/day was associated with reduction of the incidence of recurrent ischemic stroke
- ❑ We also found significant decrement of diastolic blood pressure, better control of fasting hyperglycemia, and lowering down of the level of LDL in subjects with hypercholesterolemia
- ❑ Further investigations are needed to corroborate our observations.

Limitations:

There are limitations in this study which are worth mentioning.

- These are erratic attendance of group of patients. Besides this, a group of subjects with ischemic stroke did not follow the strict methodology of tea preparation, type and amount of tea ingested as directed.

Acknowledgement:

- We are grateful to the Secretary Ramakrishna Mission Seva Pratishthan to kindly allow us to conduct the study.
- We are also thankful to the National Tea Research Foundation (NTRF) for their financial assistance.
- We would like to render our thanks to the field workers Mr. Sanjay De and Mr. Rakesh Roy for their active co-operation in field work and also to patients for their active participation.
- We are also grateful to Dr. Avijit Hazra for statistical analysis.



Thank You