Background:
Diabetes mellitus (DM) is a chronic metabolic disease that produces vascular and neurological complications. In type 2 diabetes mellitus, resistance to insulin is accompanied by an insufficient recompense in the secretion of insulin. Due to metabolic dysregulation many pathophysiological changes are seen. Brainstem auditory evoked potentials (BAEP) are the potentials recorded from the ear and vertex in response to a brief auditory stimulation to assess the conduction through auditory pathway up to the midbrain and it produces wave I to wave V. The eighth cranial nerve and brain functions are impaired in type II Diabetic patients. Aim & Objective: To study the Brainstem auditory evoked potential in type II diabetic patients and to compare it with normal individuals.

I. Introduction
Diabetes mellitus (DM) is a metabolic disease that produces vascular and neurological complications. In type 2 diabetes mellitus, resistance to insulin is accompanied by an insufficient recompense in the secretion of insulin. Due to metabolic dysregulation many pathophysiological changes are seen. Brainstem auditory evoked potentials (BAEP) are the potentials recorded from the ear and vertex in response to a brief auditory stimulation to assess the conduction through auditory pathway up to the midbrain and it produces wave I to wave V. The eighth cranial nerve and brain functions are impaired in type II Diabetic patients.

Materials and Methods:
In this study, 30 type 2 diabetes mellitus subjects were selected from department of diabetology OPD, Stanley medical college and Control group of 30 were selected from master health check up. BERA recording was done in Neurophysiology laboratory, Department of Physiology, Stanley medical college using POLYRITE MEDICAID—Neuropertect plus.

Results:
There was a significant increase in latencies of waves I, III, V and interpeak latencies of waves I-V & III-V of diabetics when compared with controls (p < 0.01).

Background:
Diabetes mellitus (DM) is a chronic metabolic and genetically inherited disease, due to the insufficient production of insulin in the pancreas or from the ineffective use of available insulin (1). It is characterized by increased blood sugar levels. It has been estimated that by 2025 there will be around 300 million diabetic individuals in the world. The pathological changes which occur in the auditory system of diabetics are: spiral ganglion atrophy, myelin sheath degeneration of the vestibulocochlear nerve, reduction in the number of nerve fibers in the spiral lamina, and thickening of the capillary walls of the stria vascularis (1). Neupathy is a late complication of DM. Many studies have described about the peripheral and autonomic nerve involvement but with the introduction of evoked potential techniques, the exploration of sensory pathway by auditory system was possible (2). Brainstem auditory evoked potential is a simple, non-invasive tool to detect changes in the auditory nerve. In this study, we want to evaluate the brainstem auditory response and the absolute and interpeak latencies in type 2 DM individuals and to compare it with age and gender matched controls.

II. MATERIALS AND METHODS
Ethical clearance was obtained from Institutional Ethical Committee. Informed consent was obtained from all subjects. This is a cross sectional study. BERA recording was done in Neurophysiology laboratory of research wing, department of physiology, Stanley medical college using POLYRITE MEDICAID—Neuroneptect plus. 30 subjects of both male and female were selected from the department of diabetology who were around 30–45 years of age group, 5 years duration of diabetes, on oral hypoglycemic drugs, with good glycemic control and normal hearing were included in the study. Smokers, alcoholics, external or middle ear diseases, ear surgery, systemic diseases, like hypertension, drugs acting on central nervous system (methyl dopa, nitrofurantoin, reserpine), neuromuscular disorders, subjects with cochlear implants, head injury or cerebrovascular accidents and many other diseases were excluded for selecting the subjects. The study was conducted from April 2012 to October 2012.

The participants are relaxed and comfortable prior to the tests. Clinical history about diabetes was collected. Written and Informed consent obtained. Pure tone audiometry done prior to

| Table 1: Anthropometric measurements of type 2 Diabetes with controls. |
|----------------------|------------------|------------------|
|                      | Cases n=30        | Controls n=30    |
| Age (yrs)            | Mean ± SD        | Mean ± SD        |
| Height (cm)          | 157.77±6.93      | 156.73±6.40      |
| Weight (kg)          | 57.37±6.06       | 57.87±6.49       |
| BMI (Kg/m²)          | 23.04±1.96       | 23.56±2.42       |
| BMI – Body Mass Index|                   |                  |

The parameters were analyzed using Student independent t-test. p < 0.05 is taken as significant.
Type 2 DM is a common endocrine and metabolic disorder leading to hyperglycemia which in turn leads to multi organ dysfunction and one of the lesser known consequences of diabetes is hearing disorder. Altered hearing function is found in diabetics. Type 2 diabetes mellitus and auditory brainstem responses - a hospital based study (Misra UK, Kalita. Clinical neurophysiology 2nd edition Elsevier publishers Chapter 2: page 11-21).

There was no statistical difference between the Type 2 DM and controls with regards to age, height, weight and BMI (p > 0.05).

There was a highly significant increase in fasting and post-prandial blood sugar and significant increase in latencies of wave I, II, III, Vand interpeak latencies (IPL) I-V, III-V in cases when compared with controls. (p < 0.01). Statistical Package for Social Sciences (SPSS) software 11.5 version was used for statistical analysis. The Student independent’ t’ test was used to compare cases and controls.

Discussion
Type 2 DM is a most common endocrine and metabolic disorder leading to hyperglycemia which in turn leads to multi organ dysfunction and one of the lesser known consequences of diabetes is hearing disorder. Altered hearing function is found in diabetics. Type 2 diabetes mellitus and auditory brainstem responses - a hospital based study (Misra UK, Kalita. Clinical neurophysiology 2nd edition Elsevier publishers Chapter 2: page 11-21).

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