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# EFFICACY OF LIRAGLUTIDE ON TREATMENT OF TYPE 2 DIABETES MELLITUS

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***Abstract:*** **Aim of this study is to recognize the efficacy and safety of liraglutide on our patients with uncontrolled type 2 diabetes.**

**Method: it is uncontrolled prospective study where patients with type 2 diabetes despite high dose of insulin their glycosylated hemoglobin more than 8%. Total insulin doses, weight of the patients, fasting blood glucose and glycosylated hemoglobin were noted in the beginning and repeated after 3 and 6 months.**

**Results: liraglutide started on 150 patients and only 128 complete the study. The mean weight reduced from 107.3 to 99 and where the mean glycosylated hemoglobin reduced from 11.2 to 8.9 after 3 months and to 8.1 after 6 months.**

**Conclusion: liraglutide is safe and has good effects on weight reduction and diabetic controlled on our patients. It is similar to what have been published internationally.**

## 1. INTRODUCTION

Liraglutide is new drugs for type 2 diabetes treatment. It is long acting glycogen- like- peptide (GLP-1) agonist. GLP-1 is secreted in response to food intake and gastric emptying (1). At the time of the diagnosis of type 2 diabetemia es, B cell function markedly impaired and the disease characterized by progressive B cell failure (2). Treatment with once daily long acting human Glycogen Like Peptide (GLP) agonist , liraglutide , demonstrate sustained improvement in blood glucose control, a reduction in body weight, low risk of hypoglycemia, and is well tolerated.(3-5). Liraglutide also increase the B cell mass (6). We aimed from this study to assess the efficacy and tolerability of liraglutide on our acts on Receptors on pancreatic B – Cells to potentiate insulin secretion. By mimicking GLP-1 Lirglutide stimulate insulin secretion and reduces glucagon secretion in a glucose -dependent manner. It also reduce food intake and slow patients compared with what have published internationally.

## 2. METHODS AND RESULTS

We choice patients with uncontrolled type 2 diabetes where glycosylated hemoglobin greater than 8%, despite high dose of insulin (more than 1 unit/kg of insulin). Baseline characteristics are given in Table 1.

One hundred and fifty patients included in the study but 23 patients failed to continue because financial reasons in 22 patients and one developed pancreatitis. All data noted in the beginning including, vital signs, glycosylated hemoglobin , weight , total insulin doses, and fasting blood glucose

They should continued on the same dose of insulin and the liraglutide started on 0.6 dually then after 5 days increased to 1.2 in all patients. Glucose home monitoring continued and once the fasting blood glucose decreased to less than 100 mg or postprandial less than 140 mg/ dl, the long acting insulin should be reduced and the glucose monitoring should be continued. clinical assessment including weight of the patients, fasting blood glucose, glycosylated hemoglobin and total daily insulin dose after 3 and 6 months of liraglutide use. With weight improvement the dose of the insulin is reduced up to one third of the original dose. Our study demonstrated reduction of glycosylated hemoglobin 1.4% after 3 months and

1.8% after 6months. p}0.0001. 31% o the patient reached standards level of glycosylated hemoglobin (less than 7%) where 43% after 6 months.

The mean reduction in fasting blood glucose is 46 mg after 3 months where 55 mg after 6 months of treatment use.

Body weight reduction 3.6 kg and 5. 1 kg after 3 and 6 months respectively. P value less than 0.03.

## 3. DISCUSSION

This study demonstrate the efficacy of liraglutide on our patients with type 2 diabetes mellitus. The effect of liraglutde in lowering glucose either improve b cell function or delay gastric emptying or reduce the appétit. Most the patients with diabetes are either overweight or obese. Liraglutide reduce the appétit and has good effect on the weight reduction.

Liraglutide is administered as a once daily subcutaneous injection.1 The starting dose is 0.6 mg daily, increased to 1.2 mg after at least one week. If required the dose can be increased to 1.8 mg to further improve glycogenic control.1

The efficacy and safety of liraglutide in type 2 diabetic patients was assessed in the LEAD [Liraglutide Effect and Action in Diabetes] programmed, a series of six randomized, parallel-group, multi-centre trials (n = 4,5,6), in which the therapeutic response to liraglutide (0.6 mg to 1.8mg) was compared with that of placebo and/or a specific comparator drug in varying combinations.4-9 Active comparators included rosiglitazone, glimepiride, insulin glargine or exenatide. Five of the six trials combined liraglutide as dual therapy (with glimepiride, metformin or another sulphonylurea) or triple therapy (with metformin & rosiglitazone, metformin & glimepiride or metformin & another sulphonylurea).

The studies, ranged from 26 to 52 weeks in duration with a primary endpoint of change in HbA1c from baseline to the end of the study. 4-9 The change in HbA1c across the six studies for the licensed dose of liraglutide (1.2 mg and 1.8 mg) ranged from a mean decrease of -0.8% to -1.5%. Active comparator changes ranged from a decrease of -1.1% (insulin glargine) to -0.4% (rosiglitazone). Placebo changes ranged from a decrease of -0.5% to an increase of +0.2%. Weight gain/loss with liraglutide, the latter an important marketing strategy, ranged from a loss of -3.2kg (1.8 mg) to a gain of +0.3kg (1.2 mg). Active comparator changes ranged from a loss of -2.9kg (exenatide) to a gain of +2.1kg (rosiglitazone). Placebo changes ranged from a loss of -1.5kg to a gain of +0.6kg

The LEAD 69 study (n = 464) compared liraglutide 1.8mg once daily with exenatide 10 mcg twice daily in combination with metformin, a sulphonylurea or both. HbA1c decreased significantly more with liraglutide than exenatide (-1.12% vs –0.79%, estimated treatment difference -0.33; 95% confidence interval (CI) -0.47 to -0.18, $p < 0.0001$). Weight loss was similar with both drugs (-3.24kg with liraglutide vs -2.87kg with exenatide, estimated treatment difference -0.38kg; 95% CI -0.99 to 0.23, $p = 0.22$).9

The most common adverse effects (AE) seen in the above studies were gastrointestinal (GI) e.g. nausea, diarrhea and vomiting.4-10 Rates of withdrawal due to these AEs were higher in the liraglutide groups than either the active comparator or placebo groups.10 Overall GI AE rates ranged from 35 – 56% with liraglutide compared with 17 - 19% with placebo.4-9

A small number of cases of pancreatitis were reported in some of the trials, although it is unknown whether they were linked to liraglutide treatment.4,5,9

We conclude from this study that liraglutid very effective in lowering glycosylated hemoglobin and reduce the weight in our patients resemble whate have been published internationally. We found it very safe only one patient had pancreatitis.

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## APPENDIX - A

**List of Tables:**

**Table 1: Basal biochemical figures**

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|---|---|
| Mean weight of the patients | 103.4 |
| Mean fasting blood glucose | 163 |
| Mean glycosylated hemoglobin | 10.1 |
| Mean insulin dose | 76 |

**Table 2: biochemical figures after 3 and 6 months of liraglutide treatment**

| Biochemical figure | After 3 months | After 6 months |
|---|---|---|
| Mean weight | 99.8 | 97.9 |
| Mean fasting blood glucose | 122 | 112 |
| Mean glycosylated HB | 8.7 | 8.5 |
| Mean insulin dose | 58 | 53 |