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Formulation and Evaluation of Herbal Antidiabetic Tablet

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ABSTRACT:

Diabetic mellitus is chronic disease that is associated with long term complication. This research gives information regarding the herbal drugs will cure the diabetic complication in patient. Herbal antidiabetic drug treat diabetic mellitus by lowering glucose level in blood and they increase the insulin amount secreted by the pancreases. In this research mostly the garlic shows the antidiabetic action in that garlic the allion is chemical component responsible to decrease glucose level in blood. When the diabetic patient getting affected by any type of injury then the neem is act as wound healing property and also it has anti-hyperglycaemic activity. In this research we were formulated herbal antidiabetic drug from garlic and Neem and evaluation were perform such as disintegration test, Dissolution test, Hardness test, angle of repose and friability test.

KEYWORDS: Antidiabetic, Formulation of tablet, Evaluation, Eugenia jambolana,gymnema Sylvester, momordica charantia

INTRODUCTION:

Diabetic mellitus is a systemic metabolic disorder which complications. is characterized by hyperglycaemia (increase amount of used glucose in blood), Hyperlipidaemia (increase amount of lipids in blood), Hyperinsulinemia (Decrease secretion of insulin in blood) (Chandraprakash Dwivedi, 2013). In this research we were prepared antidiabetic tablet which is used to cure the diabetic disorder. In the diabetic disease the insulin secretion and its action are diminish. Chronic hyperglycaemia of diabetes is associated with long term damage, Dysfunction and failure of various organ specially the eyes, Kidney, nerves, heart and blood vessels. Diabetic mellitus are occurs due to alteration of metabolism of carbohydrate, lipid and proteins. In this preparation of tablet we were selected two herbal drugs such as Garlic and Neem (Sigh, 2016).

Diabetic mellitus is associated with long term complications. For the preparation of medicines which is used to cure the diabetic's disease then it is must to know about the stability, Efficacy and safety of that dosage form (Md. Akil Hossain, 2018). Types of Diabetic mellitus (Md.Akil Hossain, 2018): There are main two type of Diabetic mellitus disorder they were classified depending upon the insulin dependency.

Type 1. Insulin dependent diabetic mellitus.

Type 2. Non-Insulin dependent Diabetic mellitus.

Type 1. This type of diabetic mellitus is occur due to autoimmune disease of beta cell. Due to the destruction of beta cells of pancreases the circulation of insulin in blood is not regulated. They are occurs in between the age of 30 years. In that the beta cells fails to respond to normal stimuli.

Type 2.: This type of diabetic mellitus is not depend on theinsulin. Obesity is the major cause of this type of diabetic mellitus. In that the beta cell count are decrease. This type of diabetic are occurs in age onward 40 year.

Symptoms – Polyuria, Polydipsia, Polyphagia, Fatigue and Long term diabetes may causes Gangrene and myocardial infraction.

OBJECTIVE:

1. To formulate herbal antidiabetic tablet by using herbal ingridents such as herbal ingredients 2. Evaluation of herbal wound healing cream such as Disintegration, Dissolution, Hardness, Friability

MATERIALS AND METHODS:

1. Preparation of extract: (Handa SS, 2008), (Tiwari P, 2011), (D.K Shrivastava, 2014)

The extract was prepared by simple maceration process. Firstly we were take 20gm of leaves of plant such asNeem. They were dried and pulverised in air and then they were soaked with 200ml water for 48hr. After 24hr solvent was decanted and residue again soaked with same solvent for 24hr. The total extract was combined and filter then the evaporation of solvent was done on heating mental this was dried and stored in the desiccator for further use.

2. Formulation of tablet: (Gurudeeban Seivaraj, 2015) Theherbal antidiabetic tablet were prepared by using wet granulation method. In this method the solvent were used for the [reparation of damp mass. All the ingredient were weighed and triturated by using mortar and pestle and this mass was passed through sieve no.8 individually. In the next step the herbal drug, starch (half quantity) and Preservatives (Methyl paraben) mixed with sufficient quantity of water along with small amount of gelatine to form dump mass i.e. coherent mass. The mass was passed through sieve no.16 to form granules and the granules were dried at 500C-600C for 15 min in hot air oven. In that dried granules, remaining quantity of starch, Talc, Magnesium stearate were added mixed with spatula. At the last prepared granules were passed for compression by single punching machine

Formulation table

Dry	A	B	C
Eugenia jambolana	120mg	120mg	120mg
Acacia catechu	80mg	80mg	80mg
Licorice	50mg	50mg	50mg
Lactose	229mg	208mg	187mg
Talc	11.25mg	22.5mg	33.75mg
Magnesium streate	2% 10mg	4% 20mg	6% 30mg

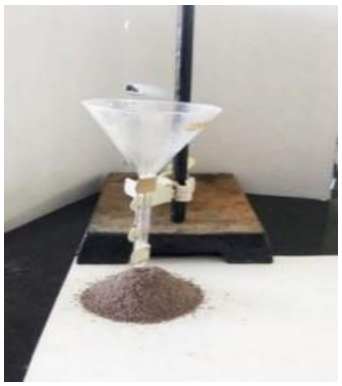
Fomulated herbal antidiabetic tablet **EVALUATION OF TABLET:**

1. Preformulation study:

A. Angle of repose: (Staniforth J, 2002) Angle of repose is were used to check the flowability of the granules in hopper before compression of tablet. Fixed funnel method is used to check the angle of repose. At the specific height the funnel was fixed on the graph paper which is placed horizontally at surface. Then the granules was passed to the funnel until the apex of the pile touched to the tip of the funnel. Radius was measured by using scale and determined the angle of repose by using following formula. = tan-1(h/r)

Where,

- Angle of Repose h – Height of pile. r – Radius of pile



Angle of Repose.

B. Bulk Density: (Sonal sahu, 2019) A known amount of granules was transferred into a 25ml of measuring cylinder, carefully level the powder without compacting and measure the bulk volume

Bulk Density = weight of powder / Bulk Volume

C. Tapped Density: (Ofori-Kwalkye k. , 2010) Tapped density is the ratio of weight of powder to theTapped volume. It was determined by tapping a measuring cylinder containing fixed quantity of powder for the specific period of time. The tapped density was calculated by using following formula.

Tapped Density = Weight of Powder / Tapped volume.

D. Hausner Ratio: (Harikesh Mayura) It was determined after the measuring of Tapped density and bulk density. It is the densitification of the herbal powder mixture which may result from the vibration of the feed hopper which was calculated by using below formula

Hausner Ratio = Tapped Density / Bulk Density

E. Carr's Index: (Staniforth J, 2002) Carr's index was used to check the compressibility and flow of the granules from hopper.
It is expressed in percentage. Carr's index was calculated by using following formula.

Carr; s Index = Bulk Volume – Tapped volume / Bulk volume × 100

2. Hardness: (Mathur P, 2011), (N, 2011) The Hardness of the Tablet is also called as Tablet Crushing strength. Harness test is used to check the hardness of the prepared tablet. In this test we can measured the force which is required for the breaking of the tablet. Monsanto tablet hardness tester is used to check the hardness of the tablet. The hardness is express in Kg/cm2.

Hardness Test

3. Weight Variation: It is also called Uniformity of weight. In this evaluation test twenty tablet were weighed separately and then average weight was determined. The percentage deviation was calculated and check for weight variation as per IP.

4. Friability Test: (Kataria, 2018) The friability test is used to check the combined effect of abrasion and stock. This test is used to check the tablet is suitable for transportation or not for that purpose Roche Friabilator is used it is laboratoryfriability tester. In that the preweighed antidiabetic tablet sample is placed in the friabilator which consist of plastic chamber that operate 100 revolution for 4 min means 25 rpm. The tablet are then dusted and reweighed. Conventional compressed tablet that loses less than that 0.5-1.0 % of their weight are generally acceptable

Friability test

5. Dissolution Test:(Brijiyog, 2019) Dissolution is the process by which a solid solute enters in the solution. It may be defined as the amount of drug substance that goes into solution per unit time. The disintegration test simply identified the time required for the tablet to break up under the condition of test and all the particles are passed through mesh no.10 screen. The rate of drug absorption of acidic drug is high in GIT. So for that purpose the rate of dissolution is determined. For determination of dissolution rate of tablet we were take 900ml of 0.1N HCL in basket of dissolution apparatus and which were rotated at 50 rpm and time limit of 20 min. The accepted amount dissolution limit for 20 min is not less than 80%.

Dissolution Test

RESULT:

Natural remedies are more acceptable as they are safer with fewer side effect than synthetic once, so a herbal antidiabetic tablet is nontoxic, safe, Efficacious and improve patient compliance as it contain herbal ingredient. This herbal antidiabetic tablet were evaluated for various evaluation test such as preformulation study (Angle of repose, bulk and Tapped density, Carr's index, Hausners ration), Hardness test, Weight variation test, Friability test and Dissolution test and they full fill the value

CONCLUSION:

The main aim of formulated herbal antidiabetic tablet was to cure or treat the Diabetic patient. It was concluded that the hebal antidiabetic tablet which are prepared from natural sources they shows fewerside effect as compared to tablet which are prepared from synthetic compound. The prepared herbal antidiabetic tablet was evaluated using various parameter and was found to be satisfied for for the treatment of diabetic patient.

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