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Herbal Antacid Preparation

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Abstract

A accessible ultramodern life brings along with it a host of problems including acidity and Gastrointestinal issues. Poor eating habits, racy food and guzzling too numerous carbonated drinks Disrupts the pH balance and natural foliage of the stomach causing both bloating and acidity making Antacids the most common tone- specified specifics available over the counter. Common Dental Procedures and oral conditions requires dentists to define NSAIDs and antibiotics which alleviates Acidity. The antacids act by negativing the acid in the stomach and by inhibiting pepsin, which is a proteolytic enzyme. Each of These cationic mariners has a characteristic pharmacological property that determines its clinical use. In recent times, demands of identification and evaluation of new medicines conceivably of factory origin are gaining fashionability for the treatment of colorful gastrointestinal conditions. Hence, herbal drugs were considered a better cover for the treatment of acid influx/ acidity with lower adverse side goods. The main ideal of the study was to elect sauces which were used as a home – remedy having parcels for negativing the Acid of the stomach viz Cumin(Cuminum cyminum), Sprague(Trachyspermum ammi), and Peppermint(Mentha piperita) and incorporate in their excerpt forms in dividually into the new expression(Bouncy grains) developed by using wet granulation Method. Antacids are generally recommended for grown-ups and children at least 12 times old, and the FDA recommends antacids as the first- line treatment for heartburn in gestation. Herbal antacids are also one of the major classes of over the Counter drugs used by patient considering its safety. Hence, in present Study we attempted to prepare two formulations, one is aluminium Hydroxide suspension and second is combination of calcium carbonate and magnesium oxide suspension aswell as compares this by marketed Formulation through antacid activity using in vitro methods viz- acid-Neutralizing capacity and buffering capacity.

Key-words: GIT, Antacid, Herbs

Introduction

Acidity or acid influx is a common condition and an abnormal One in which acid in the stomach rises up into the esophagus(1). Acidity, also called acid influx, may be a condition that's Characterized by heartburn that's felt round the lower casket Area. It's a standard condition that happens when stomach Acid flows into the food pipe. The most common acid influx Symptom is a burning sensation in the casket, and pain.(3) Stomach is an integral part of body for digestion of food and is essential part of digestion system. It produces acid which is use in Digestion of slobbered food in stomach. occasionally the acid product goes up which makes hyperacidity. It refers to a set of Symptoms caused by an imbalance between the acid concealing medium of the stomach and proximal intestine and the defensive Mechanisms that insure their safety.

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Gastric juice is made up of water, electrolytes hydrochloric acid(HCl), enzymes, mucus, and natural factor (2)

People who are more prone to acidity include: Those who overindulge in alcohol
• Those who are obese
• Those who often consume spicy food
• Those who often consume non-vegetarian food
• Those who take non-steroidal anti-inflammatory drugs
• Women nearing menopause
• Women who are pregnant
• People who suffer from medical conditions such As diabetes, asthma, hiatal hernia, peptic ulcers, Connective tissue disorders, or zollingere-ellison

Antacids are most common tone- specified specifics. Antacids are a group of medicines that have been on the request for Several times.10 The use of antacids presumably began in the first Century when Celsus used negativing worlds for abdominal torture(Crohn and Rosenak, 1935). Its use in the treatment of Peptic ulcer begun 1856, withWilliam Brinton, used Bicarbonate of potash and also bismuth to treat gastric ulcers Leading to first pathological descriptions of gastric ulcer by Jean Cruveilhier in Paris in1835.10 The use of antacids for Peptic ulcer on a scientific base began in America by Bertram Sippy in 1915, latterly Schwartz in 1910 gave his notorious dictim, ‘ no acid — no ulcer ’.10 Pickering in 1950 demonstrated that, in Cases with peptic ulcer, neutralization of the acid gastric Contents relieved pain(1). originally it was used as first- line Defense against peptic ulcer complaint; but latterly with the Discovery of proton pump impediments its use declined. presently, Antacid is used substantially for the relief of mild intermittent Gastro esophageal influx complaint(GERD) associated(6,7)

Indication

Antacids have been used for the following[8]:
• Heartburn symptoms in GERD
• Duodenal and gastric ulcers
• Stress gastritis
• Pancreatic insufficiency
• Non-ulcer dyspepsia
• Diarrhea caused bile-acid
• Biliary reflux
• Constipation
• Osteoporosis
• Urinary alkalinization
• Phosphate binding in chronic reneal

Mechanism of action

Works by neutralizing the acid present in the stomach.The Main objectives are alleviating pain, relieving pylorospasms, Avoid digestion and corrosion

Physiology of gastric acid secretion

Stashing Gastric acid is buried in the fundus of the stomach by the Parietal cells. The following inflow map summaries the process Gastric acid stashing is regulated by the following- • Neural(VagusNerve) • Paracrine(Enterogastrone, Gastrin) • Hormones(Histamine, Somatostatin) Gastric acid stashing is divided into two phases Cephalic and Gastric 4 Table 1 Two phases of gastric acid stashing 1. Cephalic • Occurs before the entry of food In the gastrointestinal tract Vagal efferents release Acetylcholine, which acts on M3 muscarinic receptors(parietalcells), causes. Gastric • Occurs after Entry of food in the Digestive system • After protein rich mess, gastrin is Buried(from antra G cells) Intestinal phase(major stashing) Gastrin Binds to CCK- 2 *** on ECL cells and release histamine Gastric phase Begins with food Entering in the small intestine Minor stashing occurs

Choleocystokinin-2receptor

Also, neural activation of PACAP (pituitary adenylate cyclase activating polypeptide) causes Histamine release from the Enterochromaffin-like cells cells which leads to Histamine H2 receptor activation (parietal cells) 8 Gastric acid regulation occurs due Decreased sensory Stimuli and gastric distention which causes decreased cephalic And gastric phase responses so less gastrin released which Causes Negative feedback by D cells in the Antrum leading to Somatostatin release and subsequently inhibition of gastrin release cand return to basal acid production .[1]

Gastric acid secretions regulated by- (9)

1. Gastric acid

Gastric acid, gastric juice, or stomach acid is a digestive fluid formed within the stomach filling. With a pH between 1 and 3, gastric acid plays a crucial part in digestion of proteins by cranking digestive enzymes, which together break down the

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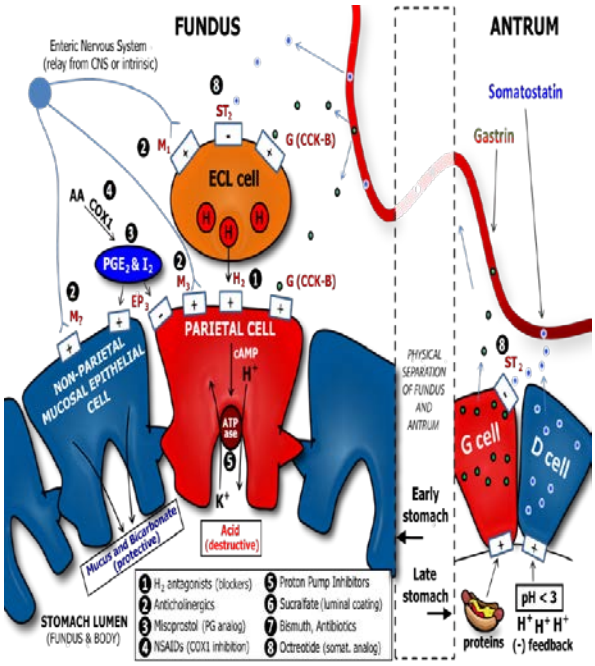
long chains of amino acids of proteins. Gastric acid is regulated in feedback systems to increase product when demanded, in +similar as after a mess. Other cells in the stomach produce bicarbonate, a base, to buffer the fluid, icing a regulated pH. These cells also produce mucus – a thick hedge to help gastric acid from damaging the stomach. The pancreas further produces large quantities of bicarbonate and secretes bicarbonate through the pancreatic conduit to the duodenum to neutralize gastric acid passing into the digestive tract



The largely acidic terrain in the stomach lumen degrades proteins(e.g., food). Peptide bonds, which comprise proteins, are labilized. The gastric principal cells of the stomach cache enzymes for protein breakdown(inactive pepsinogen, and in immaturity rennin). The low pH activates pepsinogen into the enzyme pepsin, which also aids digestion by breaking the amino acid bonds, a process called proteolysis. In addition, numerous microorganisms are inhibited or destroyed in an acidic terrain, precluding infection or sickness

2.Secretion

A typical adult mortal stomach will cache about1.5 liters of gastric acid daily.(2) Gastric acid stashing is produced in several way. Chloride and hydrogen ions are buried independently from the cytoplasm of parietal cells and mixed in the canaliculi. Gastric acid is also buried into the lumen of the gastric gland and gradationally reaches the main stomach lumen.(2) The exact manner in which the buried acid reaches the stomach lumen is controversial, as acid must first cross the fairly pH-neutral gastric mucus subcaste. There are three phases in the stashing of gastric acid which increase the stashing rate in order to digest a mess 1. The cephalic phase Thirty percent of the total gastric acid concealment to be produced is stimulated by expectation of eating and the smell or taste of food. 2. The gastric phase About sixty percent of the total acid for a mess is buried in this phase. Acid stashing is stimulated by distension of the stomach and by amino acids present in the food. 3. The intestinal phase.the remaining 10 of acid is buried when chyme enters the small intestine, and is stimulated by small intestine distension and by amino acids. The duodenal cells release enter ooxyntin which acts on parietal cells without affecting gastrin.

3. Regulation of sectretion

Gastric acid product is regulated by both the autonomic nervous system and several hormones. The parasympathetic nervous system, via the vagus whim-whams, and the hormone gastrin stimulate the parietal cell to produce gastric acid, both directly acting on parietal cells and laterally, through the stimulation of the stashing of the hormone histamine from enterochromaffine-suchlike cells(ECL). Vasoactive intestinal peptide, cholecystokinin, and secretin all inhibit product.

4. Neutralization

In the duodenum, gastric acid is annulled by bicarbonate. This also blocks gastric enzymes that have their optima in the acid range of pH. The caching of bicarbonate from the pancreas is stimulated by secretin. This polypeptide hormone gets actuated and buried from so- called S cells in the mucosa of the duodenum and jejunum when the pH in the duodenum falls below4.5 to5.0. The neutralization is described by the equation HCl NaHCO3 → NaCl H2CO

5part in complaint. In hypochlorhydria and achlorhydria, there's low or no gastric acid in the stomach, potentially leading to problems as the detergent parcels of the gastric lumen are dropped. In similar conditions, there's lesser threat of infections of the digestive tract(similar as

infection with Vibrio or Helicobacter bacteria). In Zollinger – Ellison pattern and hypercalcemia, there are increased gastrin situations, leading to redundant gastric acid product, which can beget gastric ulcers

Complication caused by acidity

Acidity can give rise to various complications including severe Pain in the chest or abdomen, excessive vomiting, difficulty in Swallowing, gastric ulcers and cancer [1].

▪ Symptoms of Acidity

Patient may complain of one or the combination of following Symptoms:

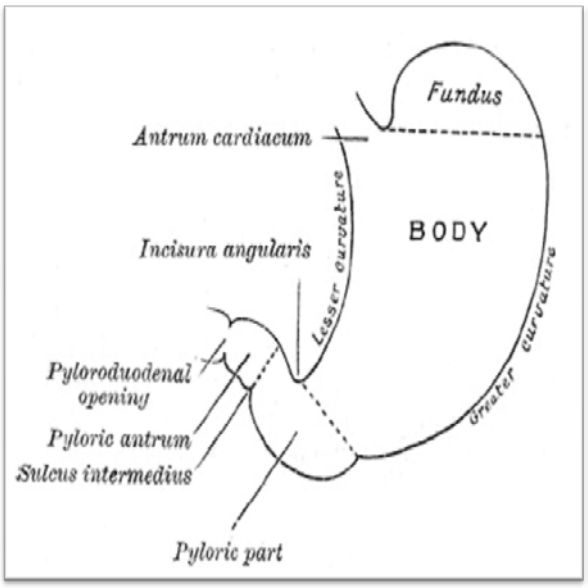
- Burning sensation in the stomach
- Burning sensation in the throat and heart
- Difficulty in swallowing
- Regurgitation
- Restlessness
- Belching
- Nausea
- Prolonged sour taste in the mouth
- Bad breath
- Indigestion
- Constipation

Functional anatomy of the stomach

The stomach consists of three anatomical areas fundus, corpus, and antrum and two functional areas oxyntic and pyloricGlands2.The stomach is 80 percent comprised of oxyntic area Containing parietal cells that produce gastric acid. The oxyntic glands have neuroendocrine cells producing paracrine and hormonal agents that modify parietal cell exertion(2,3). Pyloric glands are present in the antrum of the stomach and their main point is the presence of gastrin concealing Gcells.Somatostatin concealing D cells are present in the pyloric and Oxyntic glands and modulate gastrin release(1)

Composition of antacid

Antacids are mariners of aluminium, calcium, magnesium or Sodium or combination of these. Each swab has its own Medium of action which is important to determine which product to use them angiogenesis and granulation Towel conformation(1)



Classification of antacid (4)

1. Systemic(absorbable) antacids – Which are answerable, readily absorbable and able of Producing systemic electrolytic differences and alkalosis.E.g. sodium bicarbonate.

2. Non-systemic(non-absorbable) antacids – Which aren't absorbed to a significant Extent.

This group is farthersub-divided into following –

- Aluminum containing antacids – Aluminum hydroxide, Aluminum phosphate
- Calcium containing antacids – Calcium carbonate, Tribasic calcium phosphate
- Magnesium containing antacids – Magnesium carbonate, Magnesium oxide
- Combination antacid medications – Simethicone(defoaming agent).

Antacid activity (4)

1) Acid-

Negativing Capacity(ANC) 5 ml of each expression were transferred to 250 ml Teacup and 70 ml distilled water was added to it. It was mixed with glamorous stirrer for 1 min. also 30 ml of 1 N HCl was added to the test results with nonstop shifting for 15 min. redundant HCl was titrated with0.5 N NaOH to attain a stable pH of3.5. The number 0f mEq of Acid consumed was calculated by formula

Total m Eq = (30 X N HCl) –(V NaoH X N NaoH)

Where N HCl and N NaOH are normalcy of hydrochloric acid and sodium hydroxide

Independently and V NaOH is volume of sodium hydroxide and the result were expressed as total m Eq per gm of substance

2) Buffer Capacity(BC)

5 ml of each expression was added to 100 ml of0.1 N HCI andKept at 37oC with constant shifting. The pH of the admixture was determined after the intervals Of and 10 twinkles. A volume of 20 ml of the was also removed by a pipette And replaced by 20 ml fresh0.1 N HCI. The process was repeated at 10 twinkles interval until A pH below2.75 was reached which shows that the softening power of antacid was

Antacid formulations	mEq of acid consumed
F1 (Gleusil)	29.5
F2 (Himcocide)	26 5
F3 (Formula 1)	29.6
F4 (Formula 2)	29.6

Table 1. Acid Neutralization Capacity of Formulation

pH at time interval of minutes	Formulations			
	F1	F2	F3	F4
01 min	01	01	2.5	03
04 min	01	01	2.5	03
08 min	01	01	2.5	03
10 min	01	01	2.5	03
15 min	01	01	2.5	03
20 min	01	01	2.5	2.5

Table 2 : Buffer Capacity Of Formulation

Methods

The present work was designed at the expression and Evaluation of herbal tablets of Terminalia chebula.

Preparation of the extract

The fruits of Terminalia chebulaWere collected from original request of Saharanpur(U.P), India. Authentication New Delhi.Ref.no NISCAIR/ RHMD/ Consult 2014/2504/83. Dried fruits were coarsely powderedin an electrical grinder. The Greasepaint was consecutively uprooted with petroleum ether, ethanol and water by soxhlet outfit. The residue attained after birth was concentrated using rotary evaporator under reduced Pressure (5).

Formulation

For expression of GRDSS polymers belonging to One group i.e. anionic (carbopol) were named. Theanti-diabetic Herbal tablets were formulated by using wet granulation system. In this primarily a polymer result was prepared with the suitable Solvent. also the remaining constituents were mixed with the Active ingredients (medicine) mass, which was passed through a Proper sieve to form grains. The grains formed were further Passed through a proper sieve, dried and mixed with lubricant and also compressed to form the asked oral tablet (5).Designing of expression of oral tablets.

Designing of formulation of oral tablets

Preparation of granulesThe grains of Terminalia chebula were prepared by wet Granulation systemSubramanian CVS alternate edition). The results were prepared in distilled water by taking meetly Amounts of bounce &dicalcium phosphate and dissolving in 5 Distilled water on a water bath until translucent semisolid mass was Formed. The wet mass of gelatin/ carbopol was prepared by using needed volume of water independently. The medicine greasepaint was Transferred to motor and applicable quantum of lactose and Magnesium stearate was added to it. The result was added to the mix and mixed duly to make dough. This was passed Through sieve no..# 2(710um). The grains so attained were Dried at40.c for 1 hour. After drying grains were sized by Sieving them through sieve no.# 20 and subordinated All evaluation attained volume of medicine and the other constituents were kept constant (9)

Evaluation of blend

The mix of maquillages was estimated for the following parameters(Agarwal SP second edition) Angle ofRepose.Angle of repose was determined by using fixed channel system. The channel was set vertical to the axis of harmony and its Tip was kept at a given height(h) above a graph paper that was Placed on a left verticalshells. The mix of greasepaint was Poured through the channel and a maximum cone height(h) of Greasepaint mix was attained (5). The periphery(2r). of the base of the greasepaint cone was determined and the digression of the angle of Repose was calculated by following given equation

$$\Theta = \tan^{-1}(h/r)$$

Bulk Density.

Apparent bulk viscosity(ρb) of greasepaint mix was determined by Placingpre-sieve mix into a graduated cylinder and measuring The volume(V) and weight(M)(9). Bulk viscosity was calculatedby using given equation

$\rho b = M/V$

Tapped viscosity.

Tapped viscosity was determined by pouring the directly counted volume of greasepaint mix into the graduate cylinder and the Volume(V) was measured. also the graduated cylinder was Closed with line, and tapped by using bulk viscosity outfit till a Constant volume was maintained in the cylinder (5). The tapped viscosity was calculated by using given equation.

$Pt = M/V$

Hausner's ratio

Haussler's rate is an indicator of greasepaint inflow and was measured be. The rate of t tapped viscosity to the bulk viscosity(12). Where, ρ t is tapped viscosity and ρ b is untapped viscosity

Expression of oral tablet

Tablets were formulated as per the expression is given in table No. I. Each tablet was of 300 mg containing 200 mg of the medicine and Rest excipients. The grains were mixed in applicable amounts Of magnesium stearate(as a lubricant & anti disciple) as given in Tableno.3.3. These were also compressed into tablets by using Tablet punching machine employing9.7 mm of punch and die. Five Batches of tablets were attained and subordinated to evaluation.

Evaluation

Prepared tablets were evaluated on the basis of following Parameters

- **Thickness**:

It can be determined bv randomly selecting ten tablets from each Batch using verniercalipers[5].

- **Hardness**

It can be determined by randomly selecting ten tablets from each Batch using a Monsanto Hardness Tester. The hardness of about 3-5kg/cm2 is considered to be satisfactory foruncoatedtablets[5].

- **Friability:**

Friability of the sample was measured using a Roche Friabilator. Ten pre-weighed tablets were rotated at 25rpm for 4 minutes. The Tablets were then dusted and reweighed. Friability is generally the Loss of weight of tablet in the container due to the removal of fine Particles from the surface [5]

- **Weight variation**

Ten tablets were aimlessly named from each batch, collectively Weight; the average weight and chance divagation from the Average were calculated. It's done in order to insure uniformity in The weight of tablets in a batch(5)

- **Disintegration time**

Disintegration was determined USP handbasket type outfit. To test For decomposition time one tablets were placed in each of the 6tubes of the handbasket having a plastic slice over the tablets and the handbasket rack was placed in 1 L teacup of water. The temperature of water was maintained at 37 ± 20C. Tablets were subordinated to the oscillation at a frequence of 28- 32 cycles per nanosecond. At the end of 15 twinkles, lift the handbasket from the liquid and observe the tablets. The tablets pass the test if all tablets disintegrate at the end of 15 twinkles. In case one or two 2ablets fail to disintegrate, repeat the Test on 12 fresh tablets. The tablets pass the test if notless.Than 16 of the aggregate of 18 tablets has disintegrated(5).

Conclusion

Antacids are available as over the counter specifics, this Results in the indecorous use of these specifics with little to no Relief of symptoms. Although further effective medicines are Available antacids continue to be taken in substantial quantities. Considering their wide use, antacid have proved to be veritably safe with smaller side goods. In the conditions of Occasional heart burn, indigestion issues and in acute Conditions antacids are better treatment choice than proton Pump impediments and H2 blockers. For effective and safe use of Antacids clinicians must be well apprehensive of its pharmacological Action, suggestions contraindications and medicine relations Which can give better issues. Educating the cases about Its safe operation also gives good results, making antacids an Excellent tool for dealing with symptoms associated with Occasiona heartburn or

indigestion with smaller side goods and Immediate relief.

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