EVALUATION OF PHYSICAL AND CHEMICAL PARAMETERS OF PARACETAMOL

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ABSTRACT

Paracetamol is medicine in all country and accessible without a prescription. Many commercial types of paracetamol tablets (500mg) are available in the Syrian drug market.

The objective of this article is to evaluate the physicochemical characterizes for five commercial types of paracetamol (500 mg) tablets marketed in Syria.

Paracetamol was evaluated for mass uniformity, friability, hardness, content uniformity, and dissolution rate.

All the groups complied with the pharmacopieal specifications for mass uniformity and friability tests.

Quality of any pharmaceutical product is very important because drugs must be marketed as safe and therapeutically active formulations whose performance is consistent and predictable.

Evaluation of the physiochemical properties of the pharmaceutical products can ensure their quality as well as bioavailability and impart optimum therapeutic activity.

KEY WORDS:- Paracetamol, mechanism of action , Physical properties, chemical properties.

I. INRODUCTION

Quality control of drugs is considered important subject in the field of giving drug since the existing of many pharmaceutical industries that produce the same form for paracetamol.

The examinations for considered solid dosage form involve tests for physical properties. Tablets should pass this tests to ensure.

that patient will receive the required therapeutic efficacy, and the drug is safe for the patient throughout the expiration date (Kohler, 2009; Ansel, 2000).

Paracetamol and acetaminophen are commonly used names for drug that is chemically derived from N-acetyl-paraaminophenol (Figure.1).

It is accessible without a prescription. The main use of paracetamol is analgesic and antipyretic. It was discovered since about 95 years ago, but until now the mechanism that it affects in the body is unknown.

II. REVIEW AND LITRATURE

Paracetamol which is also called APAP (acetaminophenol) which is chemically known as N- acetyl's-p-aminophenol's broadly used as antipyretic and analgesic.

It is characterized as mildly analgesic.Paracetamol is used in management of pain like: post- surgery or cancer pain when in combination with opioid analgesic.

It is also used in the treatment of inflammatory pain.Laurie Prescott studied the future prospects of paracetamol and found out that it is much needed the better dose form for the rectal administrations.

The analgesic effects of paracetamol found to be central & because of the serotonergic pathway, the sites of primary actions are the prostaglandin synthesis. The paracetamol's action is not yet clear at molecular level.

III. DRUG PROFILE

PARACETAMOL.

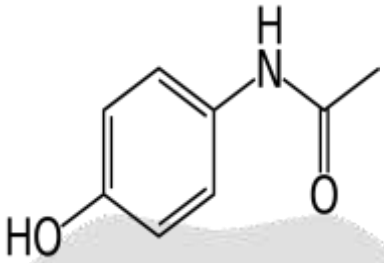

Fig:-1

▪ **IUPAC Name**:-N-(2,3,5,6-tetradeuterio-4-hydroxyphenyl)acetamide

•**Chemical Formula**:-C8H9NO2

▪**Brand Name**:-Dolo 625 ,Paracip ,Calpol

•**Rout of administration**:-By mouth, rectal, intravenous(IV)

•**Drug class**:- ✓ Analgesics and antipyretics.

MECHANISM OF ACTION:-This study is based on the comparison of available paracetamol 500 mg tablets brands in Indian market that are available for consumer use.

Ten brands of drug were taken that are coded accordingly, and assessed using the quality control parameters of weight uniformity, hardness, friability, and active ingredient content.

We concentrate in this study on five commercial brands (A, B, C, D, E) of paracetamol tablets.

The samples were chosen arbitrarily from registered pharmacies in Lattakia, Syria and have the strength of 500 mg. All the examinations had done during the product expiration dates.

IV. PLAN OF WORK

i. **Physiochemical Properties Of Paracetamol**

A. Solubility:- Soluble in water (1:70, 1:20 at 100°C), ethanol (1:7), acetone (1:13), chloroform (1:50), glycerol (1:40), methanol (1:10), propylene glycol (1:9) and solutions of alkali hydroxides; insoluble in diethyl ether. A saturated aqueous solution has a pH of

B. Stability:- Dry, pure paracetamol is stable to 45°C. Contamination with traces of para-aminophenol, and humid conditions that cause hydrolysis to para-aminophenol, result in further degradation and discoloration.

C. Partition coefficient:-

D. Partition coefficient (Pc) = 6.237 (octanol: pH 7.2 buffer.

E. Ionization of paracetamol :-Ionization of paracetamol was examined by ion mobility spectrometry equipped with corona discharge ionization sources.

F. Protein binding:-The binding of N-acetyl-4-aminophenol (paracetamol) to human and porcine plasma at both toxic and therapeutic concentrations was investigated by ultrafiltration and equilibrium dialysis over the range 50–300 μg ml−1.

G. Colour of paracetamol:-White and blue,(S174)

H. Odour:- Oder less.

I. Taste:-Bitter test due to hydroxyl group.

J. Melting point:-167 to 171°**c 760mmHg**

K. Boiling point:- 387 to 389°**c @760mmHg**

V. CONCLUSION

Summing up, paracetamol monotherapy is efficient, well tolerated by the majority of patients and safe, on condition that the drug is administered at therapeutic doses.

Each one containing 1000 mg, per day and that paracetamol is ëíhiddenií in other preparations under different names (here are about 100 simple and complex preparations in Poland).

It has been found that with increase in temperature viscosity of paracetamol solutions were decreased. Viscosity is also increased with concentration indicating molecular association or stronger solute-solvent interaction.

The positive values of Falken-Hagen coefficient (AF) and JonesDole coefficient (BJ) reveals strong solute-solute and solutesolvent interactions.

From the conductance results it is understood that with an increase in temperature Λm 0 increased due to breaking of more hydrogen bonds and hence enhancing the speed of the ions. The positive values of Walden product imply that paracetamol in water acts as a structure maker.

VI. RESULT AND DISCUSSION:-

Mechanical resistances tests: According to BP all commercial types passed the test. As per the data obtained by the experiment, pectin derived from orange peels showed good binding property as compared to starch.

The various micromeritic characteristics and flow properties of the granules obtained by wet granulation for each batch and reference batch did not show any significant variation in their values.

The values of physical properties of all batches are shown in table 2 having average of triplicate readings, with standard deviation (table 2).

The readings were obtained in triplicate and values were presented as mean with standard deviation. Weight variation among all tablets ranged between 0.065 (±0.224) mg to 0.090 (±0.31) mg.

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