LITERATURE REVIEW

- **Channer et al., (1986)** were studied the shape and surface dimensions of tablets have a significant impact on transit time through the oesophagus. For psychological reasons, patients tend to find long, thin formulations such as oval tablets easier to swallow. Significantly reduced esophageal transit times compared with round tablets of equal weight was demonstrated. Tablet surfaces with a high water adsorption capacity can also increase adherence to the esophageal mucosa and increase transit times, especially if ingested with too little water.

- **Pebley et al., (1994)** were invented the alternative method for removal of liquid by freeze drying technique to produce a rapidly dispersing tablet. It is claimed to have a lower porosity, greater density and greater mechanical strength, while still disintegrating in normal amounts of saliva / aqueous solution. However, there is a possible explosive release of liquid from the material being dried, which may disrupt the structure of the material. For this reason, the process has previously been considered unsuitable for commercial production of well-formed shapes such as dispersible tablets. However, in the process described by Pebley, it is claimed that maintaining the temperature of the matrix during primary drying between the collapse temperature and the equilibrium freezing point, gave a satisfactory product.

- **Channer et al., (1990)** were studied the various formulation factors of hard gelatin capsules and found that, the hard gelatin, when moistened, becomes sticky and firmly adheres to the esophageal mucosa. On the basis of his work, he suggested that capsule formulations are thus more prone to delayed esophageal transit time.

- **Mistry et al., (1990)** were studied the impact of crushing or dispersing of medicament for dispensing purpose. Adult patients may receive treatment with an extemporaneously prepared liquid formulation or by nurses crushing tablets. The medication and persons carrying out the procedure may be contaminated, and loss of medication will result in under dosing. When a controlled release preparation is crushed, the rate at which the drug is released and absorbed into the bloodstream may be too high and cause overdosing.
• **Ball et al., (1978)** were invented the various possible degradation factors of the drug in formulation, as per his invention the prolonged contact between the solid drug particles and the dispersion medium can be reduced by preparation of the suspension immediately prior to issue to the patient. For example, ampicillin is provided as either the base or the trihydrate, reconstituted on demand.

• **Robertson et al., (1988)** were studied the various assisting methods to overcome the swallowing problem during taking of medicines. The incidence of solid dosage form induced injury to the oesophagus has suggested methods to reduce the problem. Frequently, patients have difficulty with the tablet not leaving the mouth, or lodging in the oesophagus and not reaching the stomach. Putting the tablet or capsule on the tongue, then taking two successive gulps of water, swallowing the dose with the second swallow, often overcomes the physical barrier to swallowing created by the epiglottis, hyoid and larynx.

• **Virley et al., (1990)** were studied the various dose of formulation details of lyophilized products; he suggested that formulation of high dosage is somewhat difficult with freeze drying method due to its fragile nature. Additionally, the formulation of very high dose actives is difficult. He reported that doses up to 125mg can be accommodated, but with higher doses it is more difficult to achieve dispersion.

• **Kearley et al., (1993)** were investigated the impact of lyophilization on the various formulations. He was evaluating the impact of packaging of sensitive products in blister packing. Peelable blister packaging has been developed to allow removal of dosage units from the pack without damage, as it is not possible to push them through aluminum sealing foil typically used in blister packs without rupturing the product.

• **Armstrong et al., (1986)** were invented during formulation of tablets that doses greater than 100mg cannot be directly compressed because the weight of the tablet is too large so the formulation of tablets with high dose is easy to develop with wet granulation techniques. Therefore, for high dose drugs with poor flow and compressibility, a granulation process is used. Wet granulation is the traditional and the most popular method of granulation. In wet
granulation, the liquid plays a key role in the process. He also evaluated various properties of formulation with granulation techniques.

- **Danish et al., (1996)** were invented the impact of formulation by granulation techniques. In his formulation the tablet is granulated by moist/wet granulation and then moist mass is wet-screened to further consolidate granules, increase particle contact points and the surface area to facilitate drying.

- **Barlow et al., (1968)** were invented the theory of granulation, as per his invention granulation mechanism can be divided into three stages:

  [a] Nucleation.
  In nucleation, granule formation occurs when loose agglomerates or single particles are wetted by the binder solution and form small granules by pendular bridging.

  [b] Transition.
  Nuclei grow by two mechanisms:
  1. Single particles can be added to the nuclei by pendular bridges.
  2. Two or more nuclei may combine.

  [c] Ball growth.
  Further granule growth results in large, spherical granules, and the mean particle size of the granulating system increases with time. If agitation is continued, granule coalescence will continue and produce an unusable over-massed system.

- **Caramella et al., (1990)** were studied the impact of disintegrants on formulations. Different grade specifications for a super disintegrant will cause differences in disintegrant activity. Using calcium diphosphate tablets, showed significant differences in the disintegrant force generated by Polyplasdone-XL and Kollidon-CL. They attributed the difference to the different particle size of the two commercial brands, since similar results were obtained when samples having the same particle size range were compared.

- **H. Seager et al., (1998)** were studied the Zydis technology, as per the Seager, many patients find it difficult to swallow tablets and hard gelatin capsules and do not take their medication
as prescribed, which results incidence of non compliance and ineffective therapy. The Zydis fast dissolving dosage form is unique dosage form does not require water to aid swallowing. It is basically a freeze dried formulation.

- **Sumanta et al., (2010)** were studied the formulation and development of a fast dissolving tablets, in his study he developed the Aceclofenac fast dispersible tablets by direct compression method. Effect of superdisintegrants (such as crospovidone and sodium starch glycolate) on wetting time, disintegration time, drug content, in vitro release and stability parameters has been studied. It is concluded that fast dispersible aceclofenac tablets could be prepared by direct compression method using superdisintegrants.

- **Toshifusa Shu et al., (2002)** were attempted the development of rapid oral disintegration tablets by direct compression using co-ground mixture of D-mannitol and crospovidone. The co-ground mixture was prepared with a vibration rod mill. The tablets were formed by compression using a single punch-tableting machine after addition of the co-ground mixture to non-ground D-mannitol, crospovidone and magnesium stearate. During formulation optimization it was found that the adding coground mixture of D-mannitol and crospovidone is useful in enhancing hardness of the tablets that could not be achieved by addition of their individually ground mixture.

- **Doli et al., (2009)** were studied the various techniques available for the dispersible formulation, as per the review there are several techniques have been developed in the recent past, to improve the disintegration quality of these delicate dosage forms without affecting their integrity. This article focuses on the technologies available and the advances made so far in the field of fabrication of mouth dissolving tablets. Apart from the conventional methods of fabrication, this review also provides the detailed concept of some unique patented technologies like Zydis, Lyoc, Quicksolv, Orasolv, Durasolv, Flashtab, Oraquick, Wowtab and Ziplet along with their advantages and limitations.

- **Albertini B et al., (2003)** were studied the characterization and evaluation of taste masking granules of Acetaminophen. In his study the granules of Acetaminophen was obtained by three different method as water granulation, granulation with PVP, and with steam granulation
technique. In vitro dissolution studies, performed at pH 6.8, showed that steam granules enabled the lower dissolution rate in comparison to the water and binding solution granules; these results were then confirmed by their lower surface reactivity (DR) during the dissolution process. In conclusion, the steam granulation technique resulted a suitable method to comply the purpose of this work, without modifying the availability of the drug.

- Nakhodchi et al., (2005)\(^{28}\) were studied the various physical properties effecting the compression and other stages of formulation on various API including Paracetamol. The effects of moisture on the flow properties, tensile strength, Heckel plot (particle rearrangement, yield pressure), energies involved in compaction (gross, plastic, and elastic energies), and elastic recovery are reviewed.

- Zuurman et al., (1999)\(^{29}\) were studied the effect of magnesium stearate as a lubricant in both tablets and capsules. In tableting, the lubricant properties facilitate removal of the tablet from the tablet press. In capsules, mag stearate acts as a flow agent to facilitate capsule loading. Because it is a fatty acid, mag stearate also prevents something known as interparticle bonding, and depending on the tablet ingredient, it can enhance dissolution and absorption parameters. Because of these benefits, magnesium stearate is used in more than 80% of all tableted and encapsulated products.

- Bangudu et al., (1985)\(^{30}\) were studied the effects of composition, moisture and lubricants on the formulation of paracetamol-microcrystalline cellulose Tablets. Bangudu studies the various conditions of the stress relaxation (SR) and elastic recovery (ER) of mixtures of paracetamol and microcrystalline cellulose (Avicel) and of the tensile strengths (T) of their tablets. T was inversely proportional to ER/SR. Addition of between 2 and 4% w/w of water increased the tensile strengths of tablets, provided they contained less than 75% w/w of cellulose, but more water caused decreases in T. Additions of up to 10% w/w stearic acid also caused decreases in T.

- Sharma et al., (2009)\(^{32}\) were studied various recent developments of Fast Dissolving Drug Delivery System. He evaluated the various disadvantages of conventional dosage forms such as difficulty in swallowing (Dysphagia) is a common problem of all age groups, especially
elderly and pediatrics, because of physiological changes associated with these groups of patients. Solid dosage forms that can be disintegrated, dissolved, or suspended by saliva in the mouth resulting in easy swallowing can provide significant benefits to the pediatric and geriatric population, as well as other patients who prefer the convenience of easily swallable dosage forms.

- **Blank et al., (1988)**<sup>33</sup> were invented the spray dried Acetaminophen, which is basically utilized in formulation of various dosage form. The taste masking of Acetaminophen is prepared by the spray drying a suspension of Acetaminophen in a solution of Ethylcellulose and in an organic solvent selective for Ethylcellulose.

- **Shimizu et al., (2001)**<sup>34</sup> were invented the orally disintegrable tablets which comprise the fine granules having an average particle diameter of 400 micrometer, which fine granules comprise a composition having enteric coating on the surface of core. He describes the various composition and characterization of fast disintegrating formulation. Formulation of coated tablets was manufactured by using centrifugal fluidized coating granulation and than compressed in the tablets form.

- **Tasu et al., (1994)**<sup>35</sup> were invented the various taste masking composition with drug polymer matrix. He studied the development of a taste masking composition comprising an active with amino group and copolymer having plurality of carboxylic acid and ester groups, wherein the matrix dissociates in a media having a pH of less than 4, thereby releasing the active ingredients into the media.

- **Gebhard et al., (2000)**<sup>36</sup> were invented the formulation of rapid release tablets comprising Tolfenamic Acid with pharmaceutically acceptable salts thereof. He also evaluated the release profile of drug in media and conducted the bioavailability of formulation to insure the release and action of drug in vivo.

- **Hsiao et al., (1989)**<sup>37</sup> were invented the pharmaceutical dosage unit suitable for the masking the unpleasant taste of orally administered pharmaceutical agents and which facilitate swallowing comprises a plurality of sub dosage unit disposed within a container. Each sub dosage units is a pellet which contains an active and coated with mixture of cationic copolymer acrylate resins.
• **Rakesh P. et al., (2010)**\(^{38}\) were studied the formulation of dispersible tablet of Cefditoren Pivoxil (CP) that is intended to disintegrate rapidly into the water and form a stabilized dispersion. A direct compression method was failed to formulate dispersible tablet of CP so wet granulation method was used. In preliminary study different superdisintegrant croscarmellose sodium (CCS), sodium starch glycolate (SSG) and crospovidone were evaluated for weight variation, content uniformity, hardness, disintegration time, and friability of tablets. Microcrystalline cellulose:low substituted hydroxypropyl cellulose ratio was optimized 8:2 in whole experiment as it gives minimum disintegration time. Stability study of final batch also showed no significant changes in tablet properties.

• **Sanjay et al., (2009)**\(^{39}\) were studied the formulation and evaluation of various products using directly compressible excipients and applying freeze-thawing technique. He used the mannitol to cellulose ratio in different ratio (50:50, 60:40, and 70:30) to prepare the granules and compress the tablets. Full factorial design was used to evaluate the various factors of formulation. Water acted as a good medium for mannitol as well as a bridging liquid for agglomeration of mannitol with cellulose. The agglomerates were evaluated for percentage fines and carr’s index. Tablets were prepared on a rotary tablet press, and they were evaluated for friability, tensile strength, water absorption ratio, and disintegration time. Multiple linear regression analysis was carried out to evolve full and reduce models.

• **Muwafakk et al., (2008)**\(^{40}\) were studied the development of a novel pharmaceutical formulation that comprises a one percent weight by volume Paracetamol in a phosphate buffer adjusted to pH 7.4 by addition of few drops of 1.0 N NaOH. The concentrations of the ingredients were chosen such that the resulting solution is isotonic with body fluids. Said concentrations were theoretically calculated based on their sodium chloride equivalents. The formulation is meant to be used as a nasal spray.