JOURNAL OF PHARMACEUTICAL SCIENCE AND BIOSCIENTIFIC RESEARCH (JPSBR)

(An International Peer Reviewed Pharmaceutical Journal that Encourages Innovation and Creativities)

# Design and Development of Fast Disintigrating tablets containing Ashwagandha by Sublimation technique

Upendra Kulkarni[1]*, Deepak Manthale[2], Basawaraj S. Patil[1], Hariprasanna R.C[1],

[1]RMES'S College of Pharmacy, Gulbarga-585102

[2]MR Medical College, Gulbaga-585103

**ABSTRACT:**

Patient compliance can be increased in Ayurvedic powders by formulating them into tablets. Attempts have been made for the development of fast disintegrating tablets of Ashwagandha powder by sublimation technique. The granules containing the drug and excipients were examined for the precompretional parametes. The prepared formulations were evaluated for hardness, weight variation, friability, disintegration and wetting time. The values of precompressional parameters were within prescribed B.P. limits and indicate good free flowing properties. In all the formulations friability was less than 1% indicates tablets had a good mechanical resistance. Hardness of the tablets was found to be in the range of 3.20 – 3.60 kg/cm$^2$. The disintegration and wetting times of all formulations were decreased with increase in the concentration of subliming agents.

**Key words**: Fast-disintegrating tablets, Camphor, Ashwagandha, Crospovidone.

Article history:
Received 29 July 2011
Revised 13 sep 2011
Accepted 13 Sept 2011
Available online 12 Oct 2011

***For Correspondence:***

*Upendra kulkarni*

*RMES'S College of Pharmacy,*

*Gulbarga-585102*

*Karnataka*

*Email: upendra613@gmail.com*

**Introduction:**

Traditional medicine is a very important part of health care. Population in the developing countries still relies mainly on indigenous traditional medicine for satisfying their primary health care needs. Most of the nutraceutical preparations are based on the traditional knowledge and they are the advanced form of ancient Ayurvedic system with enhanced activity and stability. Ashwgandha is the case with ginseng, ashwgandha has been employed for numerous condition in traditional Asian therapies and /or additional disorders in contemporary herbal particles. a major traditional use of the herb is in" balancing life force", which may be regarded as an adaptogenic or anti-stress tonic effect, ashwagandha is considered to be a general promoter of health or a "rasayana" that promotes rejuvenation according to traditional ayurvedic practice.[2] Generally Ayurvedic powders to be dispersed or mixed in liquids like water, milk, honey and fruit juices etc. prior to oral administration. In such cases dose of powders is poorly regulated, as in most of the houses powder measuring devices are different and difficult to carry while traveling.[1]. To overcome from all these problems we planned to formulate fast disintegrating tablets containing Ashwagandha.

The fast disintegrating drug delivery systems is rapidly gaining acceptance as an important novel drug delivery system. This delivery system offers better patient compliance than conventional tablet dosage form.[2] Bioavailability of drug from this delivery system is significantly greater than conventional tablets.[3] The basis of vacuum drying technique is to add inert solid ingredient that volatilize readily (Camphor). Volatile material is than removed with vacuum drying, which generates a porous structure in the tablet, which leads to enhance the entry of medium into the tablet, and disintegration of tablet is going to increase.[4-5]

Ashwgandha plant

Ashwgandha Powder

## MATERIALS AND METHODS

Ashwgandha powder purchased from Multani pharma, New delhi. Camphor, Magnesium Stearate and talc were purchased from S.D. Fine chemicals Pvt. Limited, Mumbai; Crospovidone was gift sample from Maple biotech Pune. And all other chemicals and materials were of analytical grade.

### Preparation of Tablets:

Fast dissolving tablets of Ashwagandha powder were prepared by direct compression method. The drug, excipient, crospovidone (Superdisintegrant), and different concentration of camphor were mixed in a plastic container followed by compression of the blend. After compression the tablets were collected and vacuum dried at $60^{o}$ c until a constant weight was obtained.

## RESULTS AND DISCUSSION

The values of pre-compressional parameters of powder blend were within prescribed limits as per BP and indicated good free flowing properties (Table-3). The post compressional parameters results are shown in Table 4. Friability of all formulations was less then 1%, which indicates that the tablets had a good mechanical resistance. The wetting time and disintegration time decreased with increase in the concentration of volatile component. It may be due to their lowest hardness and maximum porous structure was responsible for faster water uptake, hence it facilitates the wicking action of crospovidone in bringing about faster disintegration[6].

## CONCLUSION

The results indicate that by formulating the powders into the tablets can increase dosage uniformity and patient compliance of Ayurvedic powders. The wetting time and disintegration time can be decreased in tablets containing Ashwagandha powder by increasing the porosity of the tablet by sublimation technique. The formulation AG4 was yielded best in terms of wetting time and disintegration time. Thus, it can be concluded that fast disintegrating tablets of Ayurvedic powders can be prepared with a view of obtaining faster action of the drug. The adopted technique was found to be economical and industrially feasible.

**Table 1: Formula used in the preparation of Ashwagandha tablets**

| Ingredients (mg/tablet) | Formulations | | | |
|---|---|---|---|---|
| | AG! | AG2 | AG3 | AG4 |
| Ashwagandha powder | 500 | 500 | 500 | 500 |
| Lactose | 126 | 120 | 114 | 108 |
| Crospovidone | 6 | 6 | 6 | 6 |
| Camphor | 6 | 12 | 18 | 24 |
| Magnesium stearate | 6 | 6 | 6 | 6 |
| Talc | 6 | 6 | 6 | 6 |
| Total weight | 650 | 650 | 650 | 650 |

**Table 2: Pre-compressional parameters of powder blend**

| Formulation | Parameters. | | |
|---|---|---|---|
| | Angle of repose (θ) (± SD), n=3 | Compressibility (%) (± SD), n=3 | Hausner's ratio (%) (± SD), n=3 |
| AG1 | 24.22 (0.62) | 11.00 (0.22) | 1.22(0.05) |
| AG2 | 21.33(0.76) | 10.37 (0.78) | 1.27 (0.07) |
| AG3 | 24.44 (0.65) | 10.25 (0.44) | 1.12 (0.03) |
| AG4 | 22.77(0.55) | 12.52 (0.37) | 1.10 (0.02) |

**Table 3: Evaluation parameter of tablets**

| Formulations | Weight variation (± SD), n=20 | Hardness test ($kg/cm^2$) (± SD), n=6 | Friability (%) (± SD), n=10 | Disintegration Time (sec) (± SD), n=6 | Wetting time (sec) (± SD), n=6 |
|---|---|---|---|---|---|
| AG1 | 0.7 (1.34) | 3.30 (0.00) | 0.44 (0.03) | 139 (2.00) | 453 (11.00) |
| AG2 | 0.8 (1.34) | 3.40 (0.44) | 0.40 (0.07) | 122 (3.00) | 390 (9.00) |
| AG3 | 0.6(1.20) | 3.20 (0.65) | 0.52 (0.04) | 88(4.00) | 190 (8.00) |
| AG4 | 0.5(0.65) | 3.60 (0.82) | 0.40 (0.08) | 77 (5.00) | 174 (3.00) |

**REFERENCES**


3. N.G.Raghvendra Rao, Kulkarni Upendra, Basawaraj S. Patil, Wadageri Gururaj V: Formulation and development of fast dissolving tablets of some Ayurvedic churnas by vacuum drying technique, int. j. of current pharma 2010; Vol 2:36-39.
4. http: // ezinearticles.com/ashwagandha-medicinal-uses , - interaction , - side effect , -dosage adid- 45637
5. Indurwade NH, Rajyaguru TH, Nakhat PD: Novel approach-Fast dissolving tablets. Indian Drugs. 2002; 39:405-409
6. Kuchekar BS, Badhan AC, Mahajan HS: Mouth dissolving tablet: A novel Drug delivery system. Pharma Times. 2003; 35:7-14.
7. Koizumi IK: New method of preparing highly porous rapidly saliva soluble tablets by sublimation technique. International Journal of Pharmaceutics 1997; 152:127-131.
1. Udhav S, Bagul: Manufacturing Technologies for Mouth Dissolving Tablets. Pharmainfo.net 2006:1-7.
2. Gohel MC, Patel MM, Amin AF, Agrawal R, Dave R, Bariya N: Formulation design and optimization of mouth dissolving tablets of Nimesulide using vacuum drying technique. AAPS Pharm SciTech 2004; 5(3): Article 36.