ASIAN JOURNAL OF PHARMACEUTICAL SCIENCES 11 (2016) 130–131

HOSTED BY

ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ajps

Development of curcumin floating tablets based on low density foam powder

Sakonjan Treesinchai [a], *Satit Puttipipatkhachorn* [b], *Tasana Pitaksuteepong* [a], *Srisagul Sungthongjeen* [a,*]

[a] *Department of Pharmaceutical Technology, Faculty of Pharmaceutical Sciences, Naresuan University, Phitsanulok 65000, Thailand*

[b] *Department of Manufacturing Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok 10400, Thailand*

ARTICLE INFO

Article history:
Available online 25 November 2015

Keywords:
Curcumin
Floating tablets
Sustained drug release
Floating properties

The floating drug delivery system (FDDS) has become increasingly attractive system for gastroretentive dosage forms because it can prolong gastric retention time and improve drug bioavailability [1]. Using low density material of polypropylene foam powder is one of the interesting approaches for FDDS development. This floating system has initial low density so it can float immediately without lag time. In this study, curcumin was used as a model drug because it was able to inhibit the *in vitro* growth of *Helicobacter pylori* and accelerated the healing of peptic ulcer [2]. Furthermore, curcumin is most stable in acidic condition [3]. The curcumin floating matrix tablets based on low density foam powder can prolong the presence of curcumin in the stomach for effective treatment of peptic ulcer and avoid its degradation.

The floating matrix tablets were prepared by direct compression. Each tablet contained curcumin, matrix-forming polymers (different grades of HPMC) and polypropylene foam powder (Accurel® MP1004). All ingredients were thoroughly mixed for 10 min and compressed into tablet using a hydraulic press machine (Specac Inc., USA) with 12.7 mm diameter flat-faced tooling at compression forces of 0.5 ton. The results showed that incorporation of polypropylene foam powder higher than 10%w/w into matrix tablet could provide immediate floatation upon contact with the dissolution medium without lag time. Additionally, floating times of all formulations were able to continuously float over 8 hours. Since curcumin released in 0.1 N HCl was very low, 1%w/v SLS was added in the dissolution medium. Drug release of the floating tablets depended on the matrix-forming polymer type. The drug release increased in the rank order of HPMC K100LV > HPMC K4M > HPMC K15M. The faster drug release was observed in the floating tablet with lower viscosity grade of HPMC (especially HPMC K100LV). The curcumin floating matrix tablets with good floating properties with sustained drug release were obtained in our study.

* *E-mail address:* sungts2000@yahoo.com.

Peer review under responsibility of Shenyang Pharmaceutical University.
http://dx.doi.org/10.1016/j.ajps.2015.11.092

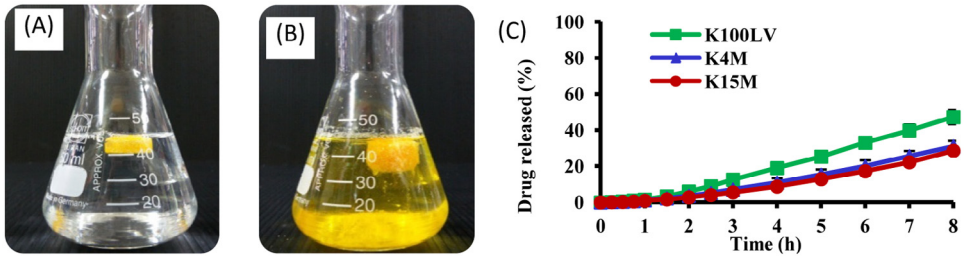

Fig. 1 – Floating properties of the floating tablets using HPMC K100LV as matrix-forming polymer with 10%w/w foam powder at 0 min (A), 8 h (B) and drug release profiles of the floating tablets with different type of matrix-forming polymer (C).

Acknowledgements

This work is financially supported by Research Funds from Naresuan University under the Office of the Higher Education Commission (grant number R2558A025), Thailand, the Center of Excellence for Innovation in Chemistry (PERCH-CIC), Office of the Higher Education Commission, Ministry of Education and the Royal Golden Jubilee Ph.D. Program (Grant No. PHD/0096/2557) under the Thailand Research Fund (TRF).

REFERENCES

[1] Sungthongjeen S, Sriamornsak P, Puttipipatkhachorn S. Design and evaluation of floating multi-layer coated tablets based on gas formation. Eur J Pharm Biopharm 2008;69:255–263.
[2] De R, Kundu P, Swarnakar S, et al. Antimicrobial activity of curcumin against *Helicobacter pylori* isolates from India and during infections in mice. Antimicrob Agents Chemother 2009;53:1592–1597.
[3] Wang YJ, Pan MH, Cheng AL, et al. Stability of curcumin in buffer solutions and characterization of its degradation products. J Pharm Biomed Anal 1997;15(12):1867–1876.