

## BAB 5

### KESIMPULAN

#### 5.1. Kesimpulan

Konsentrasi gelatin, gliserin, maupun interaksinya berpengaruh terhadap mutu fisik sediaan film *buccoadhesive* atenolol. Gelatin dan gliserin meningkatkan respon rata-rata pada *swelling index* dan *adhesion time* sedangkan pada respon pelepasan, gelatin dan gliserin cenderung menurunkan respon rata-rata pelepasan.

Berdasarkan optimasi menggunakan *Design Expert®*, formula optimum film *buccoadhesive* atenolol yang terpilih adalah pada gelatin dengan level 5,76% dan gliserin 5,93%. Respon *swelling index* yang diberikan adalah 1,67819, *adhesion time* adalah 1321,79 detik, dan respon fluks pelepasan adalah  $204,818 \mu\text{g}/\text{cm}^2 \cdot \text{h}^{-1}$ .

#### 5.2. Alur Penelitian Selanjutnya

Penelitian ini dapat dilanjutkan dengan uji penetrasi secara *in vitro* atau penggunaan kombinasi polimer hidrofobik untuk memperbaiki *adhesion time*.

## DAFTAR PUSTAKA

- Adhikari, S. N. R., B. S. Nayak, A. K. Nayak, and B. Mohanty, 2010, Formulation and Evaluation of Buccal Patches for Delivery of Atenolol, **AAPS. Pharm. Sci.**, 11(3), 1038-1044.
- Ahuja, A., R. K. Khar, and J. Ali, 1997, Mucoadhesive Drug Delivery Systems, **Drug Dev. Ind. Pharm.**, 23, 489-515.
- American Pharmaceutical Association, 2003, **Handbook of Pharmaceutical Excipients**, 4<sup>th</sup> ed., R. C. Rowe, P. J. Sheskey, and P. J. Weller (Eds.), The Pharm. Press, London, 252-253, 257-258.
- APVMA, 2004, **Guidelines for The Validation of Analytical Methods For Active Constituent, Agricultural and Veterinary Chemical Products**, Kingston, 5.
- Bartlett, J., G. Neil-Dwyer, J. McAinsh, J. M. Cruickshank, 1981,  $\beta$ -Adrenoceptor Blockers and The Blood-Brain Barrier, **Br. J. Clin. Pharmac.**, 11, 549.
- Basaliouss, E. B., S. A. Yehia, and O. N. El-Gazayerly, 2009, Fluconazole Mucoadhesive Buccal Films: In Vitro/In Vivo Performance, **Current Drug Delivery**, 6(1), 17-27.
- Baviskar, D., P. Jain, D. Jain, and A. Khaimar, 2009, Development of Mucoadhesive Buccal Patch Containing Aceclofenac: In Vitro Evaluations, **International Journal of Pharm. Tech.**, 1(4), 978-981.
- Bhalodia, R., B. Basu, K. Garala, B. Joshi, and K. Metha, 2010, Buccoadhesive Drug Delivery System: A Review, **International J. Pharm and Bio Sci.**, 6(2), 1-32.
- Bolton, S., 1990, **Pharmaceutical Statistic: Practical and Clinical Applications**, 2<sup>nd</sup> ed., Marcel Dekker, Inc., New York, 324-427.

Chang, R. K., A. H. Shojaei, X. Guo, B. A. Burnside, and R. A. Couch, 2001, Systemic Drug Delivery via the Buccal Mucosal Route, **Pharm. Tech.**, ed. Juni, 71.

Deshmane, S. V., M. A. Channawar, A. V. Candewar, U. M. Joshi, and K. R. Biyani, 2009, Chitosan Based Sustained Release Mucoadhesive Buccal Patches Containing Verapamil HCl, **Int. J. Pharm. Sci.**, 1, 219.

Deshpande, A.A., T. C. Rhodes, H. N. Shah, and W. A. Malick, 1996, Controlled Release Drug Delivery System for Prolonged Gastric Residence: An Overview, **Drug Dev. Ind. Pharm.**, 22(6), 531-539.

Green, J. M., 1996, A Practical Guide to Analytical Method Validation, in: **Analytical Chemistry**, 23.

Hariyadi, P., 2000, **Gelatin**, Vol. 1, Teknologi dan Agroindustri-Institut Pertanian Bogor, Bogor, 9.

Jasti, B. R., V. Marasanapalle, and X. Li, 2005, Modulation of Oral Transmucosal Permeability: Permeation Enhancers, in: **Drug Delivery to the Oral Cavity**, J. Swarbrick (Ed.), Taylor & Francis Group, Boca Raton, 69-73.

Johnston, T. P., M. Chittchang, and N. S. Miller, 2005, The Use of Mucoadhesive Polymers In Buccal Drug Delivery, **Advanced Drug Delivery Reviews**, vol.57, 1681-1684.

Jones, D., 2004, **Pharmaceutical Applications of Polymers for Drug Delivery**, vol. 15, 6<sup>th</sup> ed., Rapra Technology Limited, Shropshire, 11-12.

Kellaway, I. W., G. Ponchel, and D. Duchene, 2003, Oral Mucosal Drug Delivery, in: **Modified-Release Drug Delivery Technology**, M. J. Rathbone, J. Hardgraft, and M. S. Roberts (Eds.), vol. 126, Marcel Dekker, Inc., New York, 70, 350-351, 360.

- Kibbe, H. A., 2000, **Handbook of Pharmaceutical Excipients**, 3<sup>rd</sup> ed., American Pharmaceutical Association and Pharmaceutical Press, Washington, 215-217.
- Li, B. and J. R. Robinson, 2005, Preclinical Assessment of Oral Mucosal Drug Delivery Systems, in: **Drug Delivery to the Oral Cavity**, J. Swarbrick (Ed.), Taylor & Francis Group, Boca Raton, 45-47.
- Martin, A., J. Swarbrick, and A. Cammarata, 1993, **Farmasi Fisik: Dasar-Dasar Kimia Fisik Dalam Ilmu Farmasetik**, vol. 2, ed. 3, terjemahan Yoshita, Penerbit Universitas Indonesia, Jakarta, 827, 830-831.
- Mathiowitz, E., D. Chickering, J. S. Jacob, C. Santos, 1999, **Encyclopedia of Controlled Drug Delivery**, E. Mathiowitz (Ed.), vol. 1, John Wiley & Sons, Inc., New York, Chichester, Weinheim, Brisbane, Singapore, Toronto, 11.
- McEvoy, G.K., 1997, **AHFS**, Drug Information AMERICAN Society of Health System Pharmacist, Inc., Bethesda, 1212.
- Mitpracha, Y., 2008, **Effect of Plasticizers on Physicochemical Properties of Alginate Film Containing Model Drug**, thesis, Faculty of Graduate Studies, Mahidol University, Bangkok, 71-73.
- Mortazavi, S.A. and R. Aboofazeli, 2000, Preparation and In Vitro Assessment of Various Mucosa-Adhesive Films for Buccal Delivery, **Daru**, 8(1,2), 10, 13.
- Mycek, M. J., R. A. Harvey, and P. C. Champe, 2001, **Farmakologi Ulasan Bergambar**, ed. 2, terjemahan H. A. Agoes, Penerbit Widya Medika, Jakarta, 181.
- Nafrialdi., 2007, Antihipertensi, dalam: **Farmakologi dan Terapi**, ed. 5, Departemen Farmakologi dan Terapeutik Fakultas Kedokteran Universitas Indonesia, Jakarta, 343-346.

Pal, K., S. Roy, B. Prabhakar, K. Pramanik, and A. Anis, 2009, Polymers in Mucoadhesive Drug Delivery System: A Brief Note, **Design Monomers and Polymers**, vol. 12, 487-488.

Panitia Farmakope Indonesia, 1979, **Farmakope Indonesia**, ed. 3, Departemen Kesehatan Republik Indonesia, Jakarta, 15..

Peppas, N.A., D. M. Little, and Y. Huang, 2000, Bioadhesive Controlled Release Systems, in: **Handbook of Pharmaceutical Controlled Release Technology**, D. L. Wise (Ed.), Marcel Dekker, Inc., New York, 255.

Pfister, W. R. and T. K. Ghosh, 2005, Intraoral Delivery Systems: An Overview, Current Status, and Future Trends, in: **Drug Delivery to the Oral Cavity**, J. Swarbrick (Ed.), Taylor & Francis Group, Boca Raton, 7, 20.

Reynolds, J. E. F., 1982, **Martindale: The Extra Pharmacopoeia**, 28<sup>th</sup> ed., The Pharm. Press, London, 706.

Rowe, R. C., P. J. Sheskey, and P. J. Weller, 2003, **Handbook of Pharmaceutical Excipients**, 4<sup>th</sup> ed., American Pharmaceutical Association and Pharmaceutical Press, Washington, 252-253, 257.

Satishbabu, S.K. and B. P. Srinivasan, 2008, Preparation and Evaluation of Buccoadhesive Films of Atenolol, **Indian J. Pharm Sci.**, 70(2), 175-179.

Setiawati, A. dan S. Gan, 2007, Penghambat Adrenergik, dalam: **Farmakologi dan Terapi**, ed. 5, Departemen Farmakologi dan Terapeutik Fakultas Kedokteran Universitas Indonesia, Jakarta, 343, 346.

Sulistiwati, F., N. Suryani, dan A. Fajriani, 2009, Kekuatan Gelatin Tipe B Dalam Formulasi Granul Terhadap Kemampuan Mukoadhesif, **Makara, Kesehatan**, 13(1), 2.

Sweetman, S. C., 2005, **Martindale: The Complete Drug Reference**, 34<sup>th</sup> ed., Pharmaceutical Press, London, 865.

Sweetman, S. C., 2009, **Martindale: The Complete Drug Reference**, 36<sup>th</sup> ed., Pharmaceutical Press, London, 1217-1218, 2314.

US Pharmacopeial Convention, 2005, **US Pharmacopeia XXVIII**, Rockville, US Pharmacopeial Convention, Inc., 2751.

Williams, A., 2003, **Transdermal and Topical Drug Delivery**, The Pharm. Press, London, 42-44.

Winek, C. L., W. W. Wahba, C. L. Winek, Jr., and T. W. Balzer, 2001, **Winek's Drug & Chemical Blood-Level Data 2001**, 2.

Wong, C. F. and K. K. Peh, 1999, Polymeric Films As Vehicle for Buccal Delivery: Swelling, Mechanical, and Bioadhesive Properties, **J. Pharm. Pharmaceut. Sci.**, 2(2), 53.