

# FORMULATION AND STABILITY EVALUATION OF ATENOLOL EMULGEL

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## ABSTRACT

The purpose of this study is to formulate and evaluate stability of atenolol emulgel in two gel bases to which Viscolam MAC 7 and Aqupec HV 505 using various concentration of emulsion system. Evaluation on stability included organoleptic; to which colour, smell, consistency, homogeneity and bleeding, and examination on pH, viscosity and globule diameters by Freeze-thaw method during 35 days of storage. Qualitative analysis was conducted into emulgel by Thin Layer Chromatography (TLC) while quantitative analysis was conducted by spectrophotometry. Stability evaluation on viscosity and drug content gave results that FB2 and FB4 more stable compared with other six formulas. Both formulas didn't give irritation to skin.

Key words : Formulation, Emulgel, Atenolol

## INTRODUCTION

Atenolol is a beta-adrenergic receptor blocking agent without membrane stabilizing or intrinsic sympathomimetic activities and have been used for the treatment hypertension and angina pectoris. It is also reported that, in case of oral administration, it can induce the side effect such as diarrhea, nausea, ischemic colitis and mesenteric arterial thrombosis (Setiawati, 2004; Jin K., 2003). Therefore, the development of transdermal drug delivery system maintaining proper blood level for a long time without adverse effects of frequent oral administration is very important. Kim and Shin (2004) has developed and study the release of Atenolol from the EVA matrix as transdermal preparation containing various plasticizers (Cheong and Shin 2004).

Beside transparent hydrogels, gels containing both both water and oil have been developed. Most common are microemulsion gel, transparent emulsion gel emulgel, ect. (Mohamed, M.I., 2004). One of emulgel advantage is that they have faster and more complete release of the drug from vehicle to the skin and therefore higher efficacy. They also improve spread ability (Mohamed, M.I., 2004; Cheong W.C., 2004).

## EXPERIMENTALS

### Materials

Materials used in this experiment are aquadestilata, Aqupec HV 505 (PT. Sumitoseika),

oleic acid (PT. Brataco Chemical), atenolol (PT. Kalbe Farma), DMDM Hydantoin (PT. Nardev Chemie), Span 20, Tween 20, Viscolam MAC 7 (PT. Nardev Chemie).

### Methods

1. Formulation of *Emulgel* using various concentration of emulsion system
2. Physical stability evaluation into emulgels including :
  - Organoleptic (Homogeneity, consistency, smell, color and odor)
  - Phase separation in emulgels
  - pH
  - Viscosity
  - Globule diameter by Freeze thaw method
3. Qualitative analysis of atenolol in emulgels by Thin Layer Chromatography (TLC)
4. Quantitative analysis of atenolol in emulgels by UV Spectrophotometry
5. Safety test of emulgels

## RESULTS AND DISCUSSION

### 1. Formulation of *Emulgel* using various concentration of emulsion system

The formula used in this experiment shown in Table 1.

Table 1. Formula of Atenolol Emulgels

Composition (% b/b)	FA1	FA2	FA3	FA4	FB1	FB2	FB3	FB4
Atenolol	1	1	1	1	1	1	1	1
Aqupec HV-505	-	-	-	-	1	1	1	1
Viscolam MAC 7	7	7	7	7	-	-	-	-
Oleic acid	5	7,5	5	7,5	5	7,5	5	7,5
Tween 20	0,6	0,6	1	1	0,6	0,6	1	1
Span 20	0,9	0,9	1,5	1,5	0,9	0,9	1,5	1,5
Propylenglycol	5	5	5	5	5	5	5	5
Ethanol	5	5	5	5	5	5	5	5
DMDM Hydantoin	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Triethanolamine	1,2	1,2	1,2	1,2	0,4	0,4	0,4	0,4
Aquadestilata ad	100	100	100	100	100	100	100	100