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Challenges Associated with the Quantification of Tear Fluids

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Editorial

Eye is second most complex organ of the body after brain. Drug delivery to the eye is the challenging task for the pharmaceutical scientists. Topical administration to the eye is the most convenient and commonly used for the pharmacological therapy. Effectiveness of the drugs can only be determined by the pharmacokinetics and pharmacodynamics correlation. Ocular pharmacokinetics is the essential part in the drug development for the eye. Pharmacokinetics characteristics of the drug deliver to the eye is very complex. Moreover, assessment of the pharmacokinetic properties is very difficult. After topical administration of the drugs in to eye, collection of ocular tissue and aqueous humor is the routine practice in the animals. It's very difficult to conduct the study in humans. Thus, quantification of the tears is the most useful tools to study ocular pharmacokinetics [1-4].

Tear is constantly flawing from the basal glands at a flaw rate of 1.2 µL/min. The total volume of tear in the human eye is 7-10 µL. Tear contains 0.6-0.8% protein in which albumin is around 0.4% [5]. Other ingredients in tear are such as sodium, potassium, urea, glucose, mucin etc. Tear flowrate can be higher under the physical or emotional stress [6]. The normal pH of tear fluids is 6.5 to 7.6 [7]. Most challenging and difficult part is the analysis of the tears. Analysis require sensitive methodology because the volume of the tear is very low (2-3 µL). Tears can be collected by different methods such as Schirmer test strips, filter paper, cellulose sponges and graduated capillary. Unlike the other matrix such as plasma which can be collected easily and higher volume, but collection of tears also a challenging task. Schirmer test strips is the most widely used methodology for the tear collection because in this methodology tear can be collected in the large quantity also analysis is easier than other methodology as well as it causes less irritation [8-10]. Sampling method should be thoroughly standardized before beginning the pharmacokinetics.

Drugs can be extracted from the tears using simple protein precipitation, liquid-liquid extraction and solid phase extraction. Other issue associated with the method development is the availability of the blank tear matrix. To counter this issue artificial tear fluid can be prepared in the lab and method can be developed and validated and later selectivity can be assessed by using the actual tear. Complexity and availability of the tears makes interesting task for the pharmaceutical scientists to access the ocular pharmacokinetics [9-14].

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