INTRODUCTION

Data Analysis Model (ADaM) from Clinical Data Interchange Standards Consortium (CDISC) is becoming more and more popular since FDA recommends ADaM as the submission data sets in Study Data Tabulation document. ADaM data sets are considered analysis-ready, which means it includes all necessary variables to perform the statistical analysis of the data. Quick turn-around time of Pharmacokinetic (PK) and Pharmacodynamic (PD) analysis is critical during the drug development process, because it is always desirable to know a drug’s availability as early as possible.

STANDARD APPROACH TO ADaM PK/PD STUDY

In CDISC Analysis Data Model v2.1, the information provided for PK/PD analysis data set is set. Based on the Basic Data Structure (BDS) specification in the ADaM guide, standard data structure for PK analysis can be generated. The Celeron standard process of creating ADaM data sets for PK analysis includes the following steps:

1. Create SDTM EG data set.
2. Create ADaM ADPD data set based on SDTM EG data set (calculations for analysis parameters will be performed, such as the time-to-time matched change from baseline for QTcF values).
3. Analysis parameters will be calculated by scientists based on ADSC data set. The collection interval, derived rate of drug excretion, and cumulative drug excretion, is from urine data set or can be calculated based on urine data set.

ADAM DATA SET FOR THROUGHOUT QT STUDY

Because it is always desirable to know a drug’s availability as early as possible, it is always desirable to know a drug’s availability as early as possible. Quick turn-around time of Pharmacokinetic (PK) and Pharmacodynamic (PD) analysis is critical during the drug development process, because it is always desirable to know a drug’s availability as early as possible.

A sample list of information for Analysis

1. Delta QT data set
2. Delta Summary(mean) RR Rate
3. Delta Summary(mean) PR Rate
4. Delta Summary(mean) RR Duration
5. Delta Summary(mean) T-Wave Amplitude
6. Delta T-Wave Complexity

How to map

To create an ADaM data set, there are two different approaches based on the aforementioned requirements. They are:

• Another possible mapping approach:
  1. All the ECG information from the clinic collected in ECG data set is mapped to SDTM EG data set.
  2. Based on the information from SDTM EG data set, an ADaM data set (ADZC, a customized ADaM data set) is created for scientists to perform the parameters calculation. All observations from SDTM EG data set will be calculated as mean, median, maximum or minimum for analysis purposes.
  3. Analysis parameters will be calculated by scientists based on ADSC data set.
  4. Based on the information of analysis parameters provided by scientists, create SDTM ZP data set.
  5. ADSC is the name of ADaM parameter data set for TQT study, which is created for further analysis usage.

Display 1: Partial dummy data ADPD for Through QT analysis

ADAM DATA SET FOR REPRODUCTIVE SAFETY STUDY

Background

Reproductive safety is a concern in certain drugs. It is usually collected through a different specimen such as semen. The analysis for this type of results is unique, thus the customized ADaM ARPD data set should be created separately. A male reproductive safety study with semen samples is used as an example.

A sample list of information for Analysis

1. Forward progress
2. Color
3. Motility
4. Total Sperm Count
5. Volume
6. Baseline value
7. Time interval
8. Additional, baseline flag and values may be included.

Display 3: Partial dummy data ADPD for Urine PD analysis

CONCLUSION

In general, non-standard PK/PD analysis data can be prepared in two ways. In the first situation when analysis parameters can be ideally calculated by program, then the program creates the analysis parameters calculation. If the analysis parameters calculation is not possible at this moment, two data analysis data sets can be created. One is the analysis data set for merged raw data and the other is the analysis data set for calculation purposes.

Comparing with the Celeron standard ADaM PK approach, the approaches to ADaM data sets for Through QT study, reproductive safety study and urine PK study are different and not detailed in the Analysis Data Model v2.1 but can be successfully handled based on the similar definitions and the similar concepts. Additionally, with the information and experience, other PK/PD approaches could be accomplished.

REFERENCE