A New Way of Visualizing Clinical Trial Data to Provide Insight and Understanding: Swimmer Plots

A top 5 global pharmaceutical client, with whom Sciformix had already been contracted to do some of their biometrics work, asked us to help display their oncology clinical trial data in a new and different way. While traditional statistics provide P-values and other vital information, we assisted the client to see and visualize their data by using swimmer plots, providing greater insight and understanding of what the statistics meant.

Client Situation

Sciformix has provided statistics and programming support for several oncology studies for this client.

This particular study was a phase III, randomized, open label study in untreated patients with non-squamous carcinoma of the lung. The objective was to determine if drug A was superior to drug B in progression free survival (PFS) based on RECIST criteria (Response Evaluation Criteria in Solid Tumors) as well as in overall survival.

Solution

Typically in clinical studies, there’s an abundance of data to analyze and comprehend. There are hundreds of tables, listings and figures to review. Clever and effective ways of displaying the data are needed, with a requirement to often condense multiple pieces of information into one table or graph. This study was no exception.
The Swimmer Plot is relatively unknown but has the characteristic of displaying multiple pieces of data onto one sheet of paper. The swimmer plot, used in Oncology trials, but not as common in other therapeutic areas, helps to visualize data in terms of the chronology of events at a patient level. The types of events can vary and include efficacy outcomes, safety events or any other data with associated dates. Recurring events can be used as well. Usually these data are captured across different listings making it hard to see the whole picture for an individual patient.

Outcome

By creating swimmer plots, we helped the client display the data more effectively in the manuscript, which, in turn, made it easier for the reader to understand the data and draw conclusions.

In the swimmer plot below, each bar represents a patient and the length of the bar represents treatment duration. The patient ID can be placed next to each bar for identification. The vertical line at zero represents time at which a patient meets the definition of progressive disease (PD). Other events are identified in the legend key. The bars of the graph are distinguished by color based on the randomization strata variable, brain metastases at baseline.

The bars of the chart are arranged with patients with the longest time on therapy after disease progression from top to bottom. The chart shows the timing of death quite clearly with the majority of the deaths occurring many weeks after therapy stopped. Additionally, radiotherapy occurs for approximately half the patients right after disease progression while for the others it occurs several weeks later.

Treatment Duration on Study for Patients Reporting Progressive Disease (PD) in the Brain

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