**Report of Survival Analysis**

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Date: 3/25/2021

***Statistical methods:***

A total of 117 subjects were included in the study. For each subject, the DNA Lib ID, Diagnosis, Variants, PFS, OS and Primary vs. Metastasis were recorded. One datapoint was considered to be censored when the PFS/OS was not filled. The PFS/OS was calculated by subtracting Date of Diagnosis from Date of Last Contact.

The structure of the analysis includes: 1) Descriptive statistics of Diagnosis, Variants, Primary vs. Metastasis regarding Overall Survival; 2) Kaplan-Meier curve for PFS and OS; 3) Log-rank test of PFS and OS regarding variants; 4) Cox models for PFS and OS using Diagnosis, Variants and Primary vs. Metastasis as predictors.

The significance levels were set at 0.05 for all tests. The SAS 9.4 Version (SAS Institute, Inc., Cary, North Carolina) and R software Version 4.0.3 were used for data managements and analyses.

***Results:***

1. Descriptive statistics of Diagnosis, Variants, Primary vs. Metastasis regarding Overall Survival.

**Table 1. Total subject number and overall survival mean of each diagnosis and variant category**

|  | **Variants** | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | | | | | | **Yes** | | | | | | | |
| **Prim\_vs\_met** | | | | | | **Prim\_vs\_met** | | | | | | | |
| **Metastasis** | | **Primary** | | **Recurrence** | | **Metastasis** | | **Primary** | | **Recurrence** | | **metastasis** | |
| **OS** | | **OS** | | **OS** | | **OS** | | **OS** | | **OS** | | **OS** | |
| **N** | **Mean** | **N** | **Mean** | **N** | **Mean** | **N** | **Mean** | **N** | **Mean** | **N** | **Mean** | **N** | **Mean** |
| **Diagnosis** | 1 | 1475 | . | . | 1 | 8272 | 2 | 500.0 | . | . | 2 | 4841 | . | . |
| **Breast Adeno** |
| **Carcinoma fo Unknown Origin** | 5 | 181.4 | . | . | . | . | . | . | . | . | . | . | . | . |
| **Cervical Adeno** | . | . | . | . | 1 | 256.0 | . | . | . | . | . | . | . | . |
| **Cervical SCC** | . | . | . | . | . | . | 1 | 1520 | 1 | 1520 | . | . | . | . |
| **Cholangiocarcinoma** | 2 | 667.5 | . | . | . | . | . | . | . | . | . | . | . | . |
| **Conjunctival SCC** | . | . | . | . | . | . | . | . | 1 | 2197 | . | . | . | . |
| **Duodenal Neuroendocrine Tumor** | . | . | 1 | 186.0 | . | . | . | . | . | . | . | . | . | . |
| **EBV associated nasopharyngeal carc** | . | . | . | . | 1 | 1659 | . | . | . | . | . | . | . | . |
| **Endometrial Adeno** | 1 | 1162 | . | . | . | . | 7 | 405.1 | . | . | . | . | . | . |
| **Face SCC** | . | . | . | . | . | . | . | . | 1 | 368.0 | . | . | . | . |
| **GIST** | . | . | . | . | . | . | . | . | 5 | 934.8 | 1 | 4015 | . | . |
| **Gastric Adeno** | 1 | 318.0 | . | . | . | . | . | . | . | . | 1 | 501.0 | . | . |
| **Head & Neck SCC** | . | . | . | . | . | . | . | . | 1 | 1153 | . | . | . | . |
| **HiGSOvCa** | 4 | 299.5 | . | . | . | . | 5 | 855.4 | . | . | . | . | . | . |
| **LG Apendiceal Muc Tumor** | 1 | 951.0 | . | . | . | . | . | . | . | . | . | . | . | . |
| **LGSOvCa** | . | . | . | . | . | . | . | . | 1 | 894.0 | . | . | . | . |
| **Larynx SCC** | . | . | . | . | . | . | . | . | 1 | 177.0 | . | . | . | . |
| **Left Frontal Sinus SCC** | . | . | . | . | . | . | 1 | 209.0 | . | . | . | . | . | . |
| **Lung Adeno** | 1 | 78.00 | 3 | 33.00 | 5 | 2014 | 8 | 375.9 | 6 | 72.50 | 2 | 1883 | 2 | 894.0 |
| **Lung SCC** | . | . | 3 | 257.3 | . | . | 1 | 535.0 | 4 | 263.0 | . | . | . | . |
| **Lung Small Cell Carcinoma** | . | . | 6 | 189.8 | . | . | . | . | . | . | . | . | . | . |
| **Malignant Mesothelioma** | 1 | 288.0 | . | . | . | . | . | . | . | . | . | . | . | . |
| **Melanoma** | . | . | . | . | 1 | 1526 | 1 | 4239 | . | . | . | . | . | . |
| **Metastaic HNSCC** | 1 | 68.00 | . | . | . | . | . | . | . | . | . | . | . | . |
| **Metastatic RCC** | 1 | 108.0 | . | . | . | . | . | . | . | . | . | . | . | . |
| **Neuroendocrine Tumor** | . | . | . | . | 1 | 1462 | . | . | . | . | . | . | . | . |
| **Oncocytic RCC** | . | . | 1 | 722.0 | . | . | . | . | . | . | . | . | . | . |
| **Pancreatic Adeno** | 1 | 5.00 | 6 | 304.0 | . | . | 1 | 158.0 | 1 | 1.00 | . | . | . | . |
| **Pancreatic Neuroendocrine Tumor** | . | . | . | . | . | . | . | . | 1 | 1262 | . | . | . | . |
| **Pap Thyroid Carcinoma** | . | . | . | . | . | . | 1 | 1901 | . | . | . | . | . | . |
| **Papillary Thyroid Carcinoma** | . | . | . | . | . | . | 1 | 16.00 | . | . | . | . | . | . |
| **Poorly Diff Carcinoma** | 1 | 20.00 | . | . | . | . | . | . | . | . | . | . | . | . |
| **Poorly Diff Lung Carcinoma** | 1 | 537.0 | 1 | 2.00 | . | . | . | . | 1 | 146.0 | . | . | . | . |
| **Salivary Gland High Grade** | . | . | . | . | . | . | . | . | 1 | 126.0 | . | . | . | . |
| **Tongue/Tonsil SCC** | . | . | . | . | . | . | . | . | 1 | 539.0 | . | . | . | . |
| **Urothelial Carcinoma** | . | . | . | . | 1 | 1552 | . | . | . | . | . | . | . | . |

1. Kaplan-Meier curves of PFS and OS.

**Figure 1. Kaplan-Meier curve for PFS**

Chart

Description automatically generated

**Figure 2. Kaplan-Meier curve for OS**

Chart

Description automatically generated

Comments: The survival probability drops rapidly before 2000 days for both OS and PFS and gradually drops slowly between 2000 and 4000 days. After 4000 days, the survival probability tends to be stable.

1. Log-rank test regarding variants
2. PFS

|  |  |
| --- | --- |
| Test statistic | P-value |
| 2.8 | 0.09 |

Comments: As the p-value of log-rank test is 0.09 (> 0.05), we failed to reject the null and conclude that the survival probability between variant groups have no significant difference.

1. OS

|  |  |
| --- | --- |
| Test statistic | P-value |
| 3.5 | 0.06 |

Comments: As the p-value of log-rank test is 0.06 (> 0.05), we failed to reject the null and conclude that the survival probability between variant groups have no significant difference.

1. Cox model summary
2. PFS

Table

Description automatically generated

Table

Description automatically generated

1. OS

Table

Description automatically generated

Table

Description automatically generated