Multiple Myeloma is a rare form of bone marrow cancer where plasma cells accumulate in your blood stream attacking your skeletal system and nervous system, as well as your kidneys. This disease has been known to primarily affect males and more specifically African American males. In the early years of Multiple Myeloma’s diagnosis, the disease was a death sentence by various physiologies. However, in recent years, treatments have been developed to prolong the quality of life of individuals living with this disease. Using a study of 200 Multiple Myeloma patients from Algeria diagnosed during the period of 2008-2019, specific biomarkers were sought to predict the most aggressive stage of Multiple Myeloma (Stage 3). Then using the concepts of health economics and outcomes research, the cost comparisons were made between the biomarkers that predict Multiple Myeloma versus the definitive diagnostic test of a bone marrow biopsy.

To measure the effects of Multiple Myeloma on the kidneys, the blood markers of kidney stress were investigated: Creatinine Clearance, Blood Urea Nitrogen (BUN), and Potassium. In addition, the presence of bone lesions and the diagnosis stage of Multiple Myeloma were noted. Actions that reduce kidney stress as well as strengthen bones were researched to determine ways to prolong the patient’s quality of life with the disease. Twenty-one variables were considered as predictors for Multiple Myeloma.

**Methods**

Logistic Regression was used to determine whether Multiple Myeloma Stage 3 can be predicted by 21 blood tests including the significant predictors: MDCH, Creatinine Clearance, and Albumin.

Odds-Ratio Table was used to calculate the relationship between the predictor variables and the likelihood of a Multiple Myeloma patient having Stage 3.

ROC Curve displays the probability of distinguishing the chances of a patient having Stage 3 Multiple Myeloma vs having Stage 1 or 2.

Welch ANOVA Tests for ranks for heterogeneous and non-normal data was used to determine whether the Multiple Myeloma Stages predicted the patient’s median MCHC.

Levene Test was used to determine MCHC level variability for the different stages of Multiple Myeloma.

Two-mean t-Test was used to determine if Creatinine Clearance can be predicted by High Blood Pressure.

Wilcoxon Rank Sum Test was used to determine if the Potassium (presence of protein in the urine) predicts Blood Urea Nitrogen Levels.

Chi-Square Test of Independence was used to determine whether a relationship exists between (1) Osteolytic Lesions and (2) Stage of Multiple Myeloma.

**Recommended Actions**

To help support kidney function as long as possible:

- Lower your blood pressure by (1) reducing your salt intake. (2) including potassium in your diet, and (3) lowering your alcohol consumption.
- Cut back on protein to lower the risk of having protein in your urine.

To help strengthen your bones:

- Get regular exercise.
- Take vitamin D supplements.
- Raise MCHC Levels.
- Consume rich foods.
- Include vitamin B12 and folate as well as Vitamin A and C to help with your iron absorption.

Building your support system to include friends and family while living with this disease helps you to gain the strength to keep living as normally as you can to prolong the longevity of your life.