Results

For each model candidate, the right side of Figure 3 shows the hazard ratios estimated for each treatment relative to placebo. The model with both drug-BMD interaction and additional drug effects accounts for treatment differences more accurately than the model without a drug-BMD interaction term. This model is also more accurate than the null model (both drug and BMD fixed at their mean values).

Discussion

The estimation of hazard ratios using a model with a drug parameter independent of BMD was necessary for the drug parameter to reflect treatment differences, as drug parameter estimates were derived from placebo arms (where treatment effects are zero by definition). These models can estimate the drug parameter for any individual or treatment arm, and for the model with both drug-BMD interaction and additional drug effects, the model estimates the drug parameter for each treatment arm as a function of BMD. This model is also more accurate than the null model (both drug and BMD fixed at their mean values), which is a model with no drug-BMD interaction term.

Figure 3: Hazard Ratios

For each treatment arm, the hazard ratio is represented by a point on the line, with the point's position indicating the treatment effect relative to placebo. The shaded region represents the 95% confidence interval for the hazard ratio.

Future Work

Future work will focus on investigating the relationship between changes observed by drug effects on BMD and bone microarchitecture.

References


2. BMD data assembly and computation was performed in R

Additional Results, Conclusion & Future Work

Hazard models with and without a drug-BMD interaction term and an additional drug effect were compared. It was determined that there is an additional beneficial effect of some drugs on fracture risk, which is not captured by the interaction of changes in BMD and the drug by the drug-BMD interaction term.

The degree to which different therapeutic mechanisms influence fracture rate, independent of their effects on BMD

 nier or different fracture risk

Two forms of the (individual predicted values were denoted) for each dataset, left parameters were estimated using a Bayesian approach implemented in R/BDA (v. 3.1.2). A random effect was applied to the baseline hazard, allowing for differences between the study arms. The likelihood in the time to first fracture in the NHANES dataset was the form:

Fractional change for the effect of a drug parameter independent of BMD was necessary for the drug parameter to reflect treatment differences, as drug parameter estimates were derived from placebo arms (where treatment effects are zero by definition). These models can estimate the drug parameter for any individual or treatment arm, and for the model with both drug-BMD interaction and additional drug effects, the model estimates the drug parameter for each treatment arm as a function of BMD. This model is also more accurate than the null model (both drug and BMD fixed at their mean values), which is a model with no drug-BMD interaction term.

Future work will focus on investigating the relationship between changes observed by drug effects on BMD and bone microarchitecture.

References


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