This paper considers the problem of modeling migraine severity assessments and their dependence on weather and time characteristics. We take on the viewpoint of a patient who is interested in an individual migraine management strategy. Since factors influencing migraine can differ between patients in number and magnitude, we show how a patient’s headache calendar reporting the severity measurements on an ordinal scale can be used to determine the dominating factors for this special patient. One also has to account for dependencies among the measurements. For this the autoregressive ordinal probit (AOP) model of Müller and Czado (2005) is utilized and fitted to a single patient’s migraine data by a grouped move multigrid Monte Carlo (GM-MGMC) Gibbs sampler. Initially, covariates are selected using proportional odds models. Model fit and model comparison are discussed. A comparison with proportional odds specifications shows that the AOP models are preferred.