DNA image cytometry offers a great potential for the non-invasive oral cancer early diagnosis. Oral exfoliated cells were collected, Pap smears slides were obtained and further stained with foregen staining. DNA amount of cells were quantified via image analysis using the classifier, which was translated as the indicator of the cell dividing. was quantified via Foregan staining with normal brush during regular dental care practice, the Pap smears were obtained. Often time, we are dealing a cell populations with mixed populations. In this research, we explore a novel statistical procedure to strip out the normal and ditotic cell population so that cells with malinaticed dividing can be disterned from the samples. Incopporated with currently accepted the clinical diagnosis criteria, a new set of variables were created which cover the longer range of D.I. value axis. We trained several prediction models and the best model was selected according to a set of assessment metrics. The model showed high sensitivity and specificity when applied onto the allocated test datasets. In the end, we used the model to predict the OLK patients and created a cancer risk index, which will guide the clinician to design the follow up plan.