Objectives:
To determine whether artificial intelligence might be useful in weighting the importance of clinical and sonographic (US) preoperative variables predicting the risk of lymph node metastases in patients undergoing surgical staging for endometrial cancer.

Methods:
Retrospective study evaluating the last 100 consecutive endometrial cancer patients undergoing US before surgery between 2017 and 2019. Using artificial neuronal network (ANN) analysis we estimated the importance of different variables predicting the risk of nodal involvement. Clinical, histological and US variables were evaluated. ANN simulates a biological neuronal system and similarly to neurons, ANN acquires knowledge through a learning-phase process allowing weighting the importance of covariates, thus establishing how much a variable influences a multifactorial phenomenon.

Results:
The prevalence of patients diagnosed with nodal disease at surgical staging was 16%. Using ANN we observed that the three main US factors predicting nodal metastasis were: myometrial invasion at US (importance: 0.212), echogenicity of the tumor at US (importance: 0.131) and histology at pre-operative biopsy (importance: 0.099). Overall, 79% (79/100) of patients (pts) had endometrial endometrioid tumor detected at pre-operative biopsy; among this subgroup of pts the main factors predicting nodal spread were: myometrial invasion at US (importance 0.218), echogenicity of the tumor (importance 0.170) and cervical invasion at US (importance 0.147).

Conclusions:
According to our results, myometrial invasion at US and echogenicity of the tumor should be considered the most important factors predicting nodal involvement in endometrial cancer patients. These data are confirmed in the subgroup analysis of endometrioid tumors only.