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THE RELATION BETWEEN I-PSS AND THE OBJECTIVE PARAMETERS IN THE DIAGNOSIS OF BOO: STATISTICAL ANALYSIS AND APPLICATION OF ANN.

Hypothesis / aims of study
This work aims at objectively evaluating value of scores and their correlation to objective parameters. The value of Artificial Neural Network (ANN) in the prediction of (BOO) was experimented

Study design, materials and methods
460 male patients, with symptoms of BPH were prospectively included in this study. Mean age: 60.4+/- 9.4 years. All patients had clinical examination, PSA, flow rate, TRUS, OPD cystoscopy, filling and voiding cystometry & pressure-flow studies. Patients answered an Arabic translation of I-PSS. Spearman's (r) coefficient was used. A feed forward back propagation ANN was designed. The input layer included 7 neurons, hidden layer 15 neurons and output layer 3 neurons. Figure 1 shows a simple architecture of an ANN. Training set composed of records of 305 patients and 155 records in testing set. The input consisted of items of I-PSS and the output was: obstructed, non- obstructed and equivocal, as compared to results of pressure flow study.

Results
No correlation was found between individual questions of the I-PSS and objective parameters. This was the case when score of obstructive, irritative symptoms and total score were correlated to same set of objective parameters. Figure 2 displays scatter diagram of the correlation between total score and BOO.
Using ANN, in the training set, diagnostic accuracy for prediction of obstruction is 94%, while in the testing set; accuracy in predicting obstruction is 87%. Overall accuracy in testing set is 73%.

Interpretation of results
Symptom scores could not be used in evaluation of BOO or in the evaluation and/or the comparison of different treatment modalities of BPH. ANN model is helpful in predicting BOO with a good percentage of accuracy. ANN model can spare 73 % of patients invasive urodynamics

Concluding message
ANN is a potentially useful diagnostic tool. A commercially available version of the ANN used is currently under experimentation, together with another model based on non-invasive objective parameters.
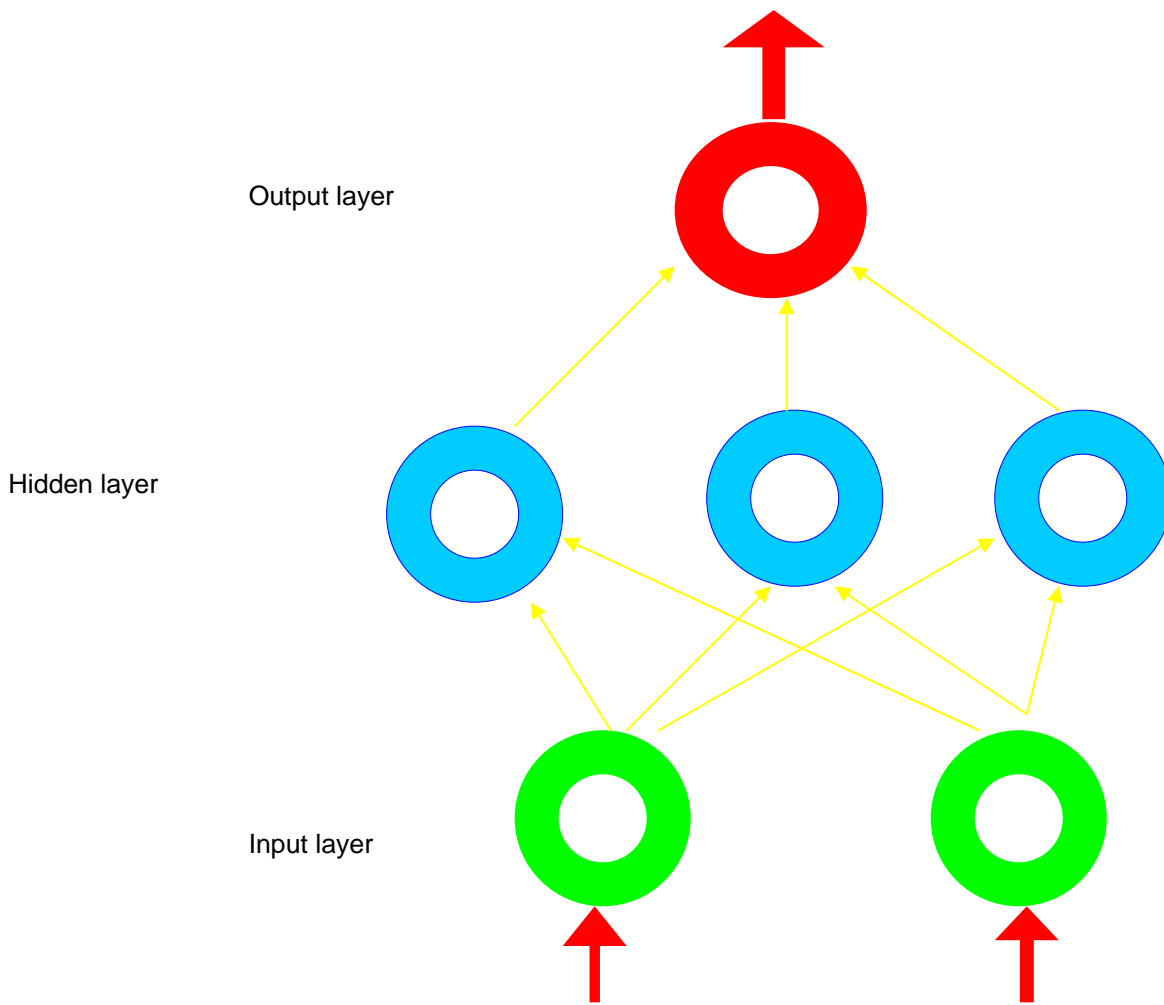
Output layer

Hidden layer

Input layer

Figure 1:The architecture of a back-propagation ANN MLP model
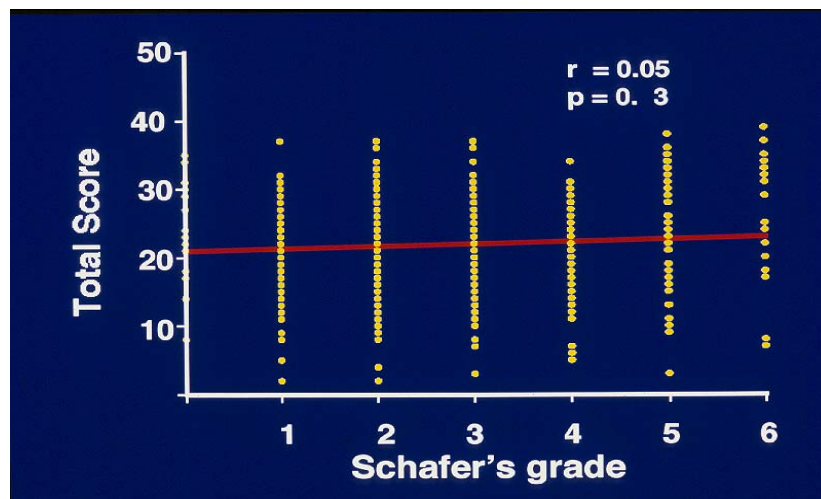

r = 0.05
p = 0. 3

Figure 2: A scatter diagram of Total score correlation to Schafer's grade of obstruction