P0573 **Neonatal pertussis diagnosis: procalcitonin low level and high lymphocytes count are able to discriminate pertussis from bacterial and viral infections**

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Background: Pertussis might be particularly severe in neonates, where very high level of lymphocytes is associated with poor outcome. Culture on nasopharyngeal swab is the main test for diagnosis; the molecular test, although more sensitive, is not widely available.

Materials/methods: All the 14 patients admitted for pertussis (group P) between June 2016 and June 2017 were evaluated; a nasopharyngeal swab for rtPCR was performed together with procalcitonin (PCT) and standard microbiological and laboratory tests.Other 28 consecutive patients of the same age were enrolled, 14 with a viral respiratory infection (group V) and 14 with a bacterial respiratory infection (group B). Results were compared between the 3 groups with appropriate statistical tests and a post-hoc pairwise comparisons were also performed. A decision tree was built as multivariate predictive model.

Results: Group P laboratory tests confirmed the expected lymphocytosis (17.718 cells/mm^{3}on average [13.279-20.670]); PCT level was below the threshold of 0,5 ng/ml in all the patients of this group (0,05$\pm$0,02 ng/dl).
The decision tree, built considering all the available variables, showed a major role for PCT in predicting the diagnosis. A value of PCT ≥0.75 ng/dl selected the 14 subjects with bacterial infections. For PCT<0.75 ng/dl, if lymphocytes are ≥10400/mm^3 the 14 patients with pertussis were selected, while lymphocytes <10400/mm^3 indicated the 14 subjects with viral etiology (**Figure 1**).
The predictors ranking of importance was found with a multinomial roc analysis. We computed an AUC equal to 0.963 for PCT, to 0.860 for lymphocytes, to 0.852 for white cells and to 0.665 for age.

Conclusions: Pertussis in Italy is still a frequent and severe disease among neonates. The diagnosis of pertussis in the presence of associated symptoms might be aimed by our algorithm using a negative procalcitonin value and lymphocytes count, especially in those hospitals where molecular tests are not available. In neonates, procalcitonin should be added to the laboratory tests to perform at admission.

Figure 1. Decision tree built as multivariate predictive model of pertussis.
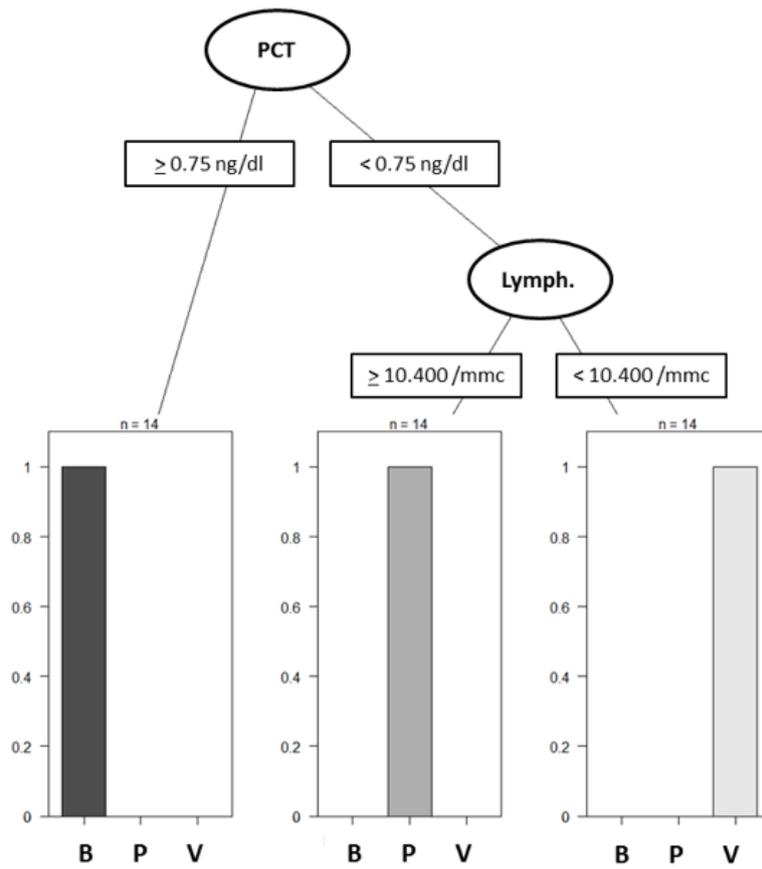
Legend. PCT = procalcitonine; Lymph = lymphocytes; B, P and V indicates groups.