Cyp c 1 or Gad c 1 for fish allergy component-resolved diagnostics: is this a question?

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Aims: To compare the performance of rGad c 1 and rCyp c 1 in fish sIgE component-resolved diagnostics.

Methods: Retrospective analysis of laboratory reports for 78 outpatients (median age 12 years, range 0.8 – 66; 40 males) having undergone fish sIgE component-resolved diagnostics between November 2011 and July 2016. Comparison of ImmunoCAP 250 results for sIgE to rCyp c 1 and rGad c 1 was done for 46 patients (22 males; median age 13 years, range 0.8 – 66). Comparison of ImmunoCAP 250 and ISAC 112 results was done for 46 patients (26 males; median age 13; range 3-58; 17 rCyp c 1 + rGad c 1+ ISAC; 29 rCyp c 1 or rGad c 1 + ISAC).

Results: 44/46 (96%) singleplex assays yielded concordant pos/neg results (18 double negative, 26 double positive). Both discordant results were rescued by rCyp c 1 testing (0.44 and 0.11 kUA/L). Among double positive results, median levels of sIgE to rCyp c 1 were slightly higher (3.1 vs 2.5 kUA/L, not significant). 39/46 (85%) ISAC 112 and ImmunoCAP 250 assays yielded concordant pos/neg results (9 double negative, 30 double positive). All discordant results (7/46 = 15%) were negative with ISAC 112 and positive with ImmunoCAP 250 (sIgE to rCyp c 1 0.18 – 12.4 kUA/L; sIgE to rGad c 1 0.18 – 0.65 kUA/L). Among double positive results, median levels of sIgE to rGad c 1 were slightly higher with ISAC 112 (median 6.1 ISU, range 0.8 – 89) than with ImmunoCAP rGad c 1 (5.1 kUA/L, range 0.67 – 68) and ImmunoCAP rCyp c 1 (4.2 kUA/L, range 0.56 – 156), but this difference was not significant.

Discussion: Currently, two recombinant beta-parvalbumins are available for fish sIgE component-resolved diagnostics. Both can be used for singleplex ImmunoCAP assays, while ISAC 112 only contains rGad c 1. Data on rCyp c 1 and rGad c 1 performances are scarce and have not been updated for ISAC 112. In our hands, singleplex rCyp c 1 and rGad c 1 display very similar performances in a vast majority of patients. rCyp c 1 may offer better detection for low values of 1 kUA/L or less. rGad c 1 microarrayed on ISAC 112 lacks sensitivity for low values (15% false negative), but positive results are well correlated with singleplex rGad c 1 and rCyp c 1.

Conclusion: Singleplex assay of sIgE to rCyp c 1 offers a very slight increase in sensitivity of detection compared with rGad c 1. rGad c 1 microarrayed on ISAC 112 is prone to false negatives (up to 15%) for low levels, but when positive it is well correlated to singleplex results.