Review of EQA specimens containing multiple faecal parasites:
a 3 year analysis

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Introduction
UK NEQAS Parasitology has been successfully running an External Quality Assessment (EQA) scheme for microscopy based detection of faecal parasites since 1980s. Poor performance among participants was consistently noted amongst faecal specimens that contained multiple parasites.

Aims
• To calculate error rate for multi-parasite EQA specimens.
• To identify reasons for common errors amongst participants.
• To identify and offer relevant support needed by participants to better their performance in handling such specimens.

Materials and Methods
• 557 labs currently participate in our Faecal Parasitology (FP) scheme.
• 14 multiple parasite samples were distributed from June 2015 to February 2019.
• Scheme includes ova and cysts of faecal parasites.
• Specimen type: faecal sample for concentration

Results

Figure 2: Parasites sent

<table>
<thead>
<tr>
<th>Specimen number</th>
<th>Parasite 1</th>
<th>Parasite 2</th>
<th>Parasite 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>4851</td>
<td>Ascaris lumbricoides</td>
<td>Giardia intestinalis</td>
<td></td>
</tr>
<tr>
<td>4566</td>
<td>Entamoeba histolytica</td>
<td>Trichuris trichiura</td>
<td></td>
</tr>
<tr>
<td>4221</td>
<td>Ascaris lumbricoides</td>
<td>Trichuris trichiura</td>
<td></td>
</tr>
<tr>
<td>4222</td>
<td>Ascaris lumbricoides</td>
<td>Trichuris trichiura</td>
<td></td>
</tr>
</tbody>
</table>
| 3953            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.
| 3861            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.
| 3862            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.
| 3414            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.
| 3336            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.
| 2919            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.
| 2664            | Ascaris lumbricoides | Trichuris trichiura | Hookworm sp.

Figure 3: Participant’s results

- 70.66% of the participants submitted the correct results with 29.34% of participants failing to find the correct parasites in the samples when there are two or three parasites are present.

Discussions

- Faecal Microscopy requires skills and this can be achieved through proper training and refresher courses. The parasites not being reported can lead to the deduction in score which results in poor performance and has accreditation implications. Through this study, UK NEQAS Parasitology has identified and flagged such issues.

- Common problems with the parasitic identification are:
  • The participants stop looking after one parasite was identified.
  • If one of the parasites in the sample was present at significantly higher number, the search for any other parasites was not done (thereby missing parasites at lower number).
  • Incorrect use of concentration technique leads to poor recovery of the parasites.
  • Some laboratories do not use iodine as a temporary stain to facilitate the recognition of cysts.
  • Overuse of iodine results in masking the ova present in the samples.
  • Failure to use an eyepiece graticule or inability to measure correctly leads to wrong speciation of parasites.
  • Inexperienced personnel in the identification of parasites.
  • Some participants do not examine sufficient amount of faecal material, low number of parasites may be missed completely.
  • Failure to identify and differentiate cysts and ova especially small cysts.
  • Misidentification of artefact or faecal debris that resembles parasitic forms.
  • No one method could be attributed to missed or wrong identifications.

Next steps: As next steps, the following have been implemented: advice given to participants on how to improve their performance, teaching sheets describing characteristics of parasites included in every report, dedicated parasitology teaching programme offered to all participants, public engagement through attendance at conferences and meetings and publications discussing these results.

Recommendations:
• A faecal concentration method increases the chance of finding parasites especially in low number.
• The entire specimen should be analysed using correct protocol for concentration method.
• Reference for guidance: Manser et al. 2016 ; PLOS Neglected Tropical Diseases. PMID: 27073836