**Supplementary Material for online publication only**

“International multi-specialty Delphi survey: Identification of diagnostic criteria for hepatic and renal cyst infection”

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**Supplementary Table 1.** Proposed reporting items for Delphi studies, adapted from Diamond et al.[1]

|  |  |
| --- | --- |
| 1. Criteria | 1. Score |
| Were selection criteria from participants reproducible? |  |
| No | 0 |
| Yes | 1 |
| Was the number of rounds to be performed stated? |  |
| No | 0 |
| Yes | 1 |
| Were criteria for dropping items clearly stated? |  |
| No | 0 |
| Yes | 1 |
| Were alternate stopping criteria specified (i.e. maximum number of rounds)? |  |
| No | 0 |
| Yes | 1 |
| Total | **(0-4)** |

**Supplementary Table 2.** Calculation of the disagreement index[2], adapted from Maverakis et al.[3]

|  |  |
| --- | --- |
| 1. Variable | Formula |
| IPR | Upper limit IPR (67th percentile) – lower limit IPR (33rd percentile) |
| IPRCP | (lower limit IPR + upper limit IPR) / 2 |
| Asymmetry index | Distance between IPRCP and 5 |
| IPRAS | 2.35 + (1.5 \* asymmetry index) |
| Disagreement index | IPR / IPRAS |

*Abbreviations*: IPR, interpercentile range; IPRCP, the central point of IPR; IPRAS, interpercentile range adjusted for symmetry.

**Supplementary Table 3.** Final result - diagnostic items rated uncertain or inappropriate within three Delphi rounds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Hepatic cyst infection** | **Median (IPR)** | **DI** | **Renal cyst infection** | **Median (IPR)** | **DI** |
| **Uncertain (3.5-6.4) (n=25)** |  |  | **Uncertain (3.5-6.4) (n=15)** |  |  |
| CT or MRI detecting heterogeneous content in a cyst | 6.0 (6.0-7.0) | 0.22 | CT or MRI detecting heterogeneous content in a cyst | 6.0 (6.0-7.0) | 0.22 |
| SPECT with Ga67 showing abnormal uptake by a cyst | 6.0 (6.0-7.0) | 0.22 | **Scintigraphy with Ga67 showing abnormal uptake in a cysta** | 6.0 (5.2-6.8) | 0.40 |
| USG detecting cellular debris in a cyst | 6.0 (5.0-6.0) | 0.32 | USG detecting cellular debris in a cyst | 6.0 (5.0-6.8) | 0.48 |
| **Scintigraphy with Ga67 showing abnormal uptake in a cysta** | 6.0 (5.0-6.0) | 0.32 | USG detecting a thickened cyst wall | 6.0 (6.0-6.0) | 0 |
| USG detecting a thickened cyst wall | 6.0 (5.0-6.0) | 0.32 | CT detecting a focal high density in a cyst | 6.0 (5.0-6.0) | 0.32 |
| CT detecting a focal high density in a cyst | 5.5 (5.0-6.0) | 0.32 | DWI showing a higher density of a cyst compared to normal cysts | 6.0 (5.0-6.0) | 0.32 |
| Marked decrease in ADC on DWI | 5.0 (5.0-6.0) | 0.32 | Marked decrease in ADC on DWI | 5.0 (5.0-6.0) | 0.32 |
| Increased serum CA19-9 compared to baseline | 5.0 (5.0-6.0) | 0.32 | Absence of any significant recent intracystic bleeding | 5.0 (3.0-6.0) | 0.97 |
| Unilateral acute flank pain | 5.0 (4.2-6.0) | 0.70 | Generalized abdominal pain | 5.0 (4.0-5.0) | 0.32 |
| CT detecting perinephric inflammatory fat stripes | 5.0 (3.2-6.0) | 0.95 | Ongoing hemo-/peritoneal dialysis | 5.0 (3.2-5.0) | 0.48 |
| Malaise | 5.0 (4.0-5.8) | 0.70 | Dysuria | 4.5 (4.0-5.0) | 0.32 |
| Absence of any significant recent intracystic bleeding | 5.0 (3.0-5.8) | 0.85 | Macroscopic hematuria | 4.5 (3.2-5.0) | 0.48 |
| Increased serum γ-GT ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 | Malaise | 4.0 (3.2-5.0) | 0.48 |
| Increased serum CA19-9 ( > 106 U/ml) | 5.0 (4.0-5.0) | 0.32 | USG detecting acoustic enhancement in a cyst | 4.0 (4.0-4.0) | 0 |
| Increased serum ALP ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 | > 10% unintentional weight loss | 4.0 (3.0-4.0) | 0.22 |
| Acute shoulder pain | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Generalized abdominal pain | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Ongoing hemo-/peritoneal dialysis | 5.0 (3.2-5.0) | 0.48 |  |  |  |
| Increased serum AST ( > 2x ULN) | 4.0 (4.0-5.0) | 0.32 |  |  |  |
| Increased serum ALT ( > 2x ULN) | 4.0 (4.0-5.0) | 0.32 |  |  |  |
| Acute back pain | 4.0 (3.0-5.0) | 0.52 |  |  |  |
| Loss of appetite | 4.0 (3.2-4.8) | 0.40 |  |  |  |
| USG detecting acoustic enhancement in a cyst | 4.0 (4.0-4.0) | 0 |  |  |  |
| >10% unintentional weight loss | 4.0 (3.0-4.0) | 0.22 |  |  |  |
| Increased serum conjugated bilirubin ( > 2x ULN) | 4.0 (3.0-4.0) | 0.22 |  |  |  |
| **Inappropriate (1.0-3.4) (n=12)** |  |  | **Inappropriate (1.0-3.4) (n=18)** |  |  |
| Nausea | 3.0 (3.0-5.0) | 0.52 | Acute shoulder pain | 3.0 (2.0-5.0) | 0.65 |
| Fatigue | 3.0 (2.0-5.0) | 0.65 | Fatigue | 3.0 (2.0-5.0) | 0.65 |
| Vomiting | 3.0 (2.0-4.0) | 0.37 | Loss of appetite | 3.0 (3.0-4.0) | 0.22 |
| Female gender | 2.0 (1.0-5.0) | 0.75 | Microscopic hematuria | 3.0 (3.0-4.0) | 0.22 |
| Tenderness in renal area | 2.0 (1.0-4.0) | 0.49 | Nausea | 3.0 (2.0-4.0) | 0.37 |
| Recent instrumentation of the urinary tract | 2.0 (1.0-3.0) | 0.29 | Acute pain in liver area | 3.0 (2.0-4.0) | 0.37 |
| Recent urinary tract infection | 2.0 (1.0-3.0) | 0.29 | Female gender | 2.0 (1.0-4.8) | 0.69 |
| Dysuria | 2.0 (1.0-2.1) | 0.15 | Tenderness in liver area | 2.0 (1.9-4.0) | 0.39 |
| Positive urine culture | 1.0 (1.0-2.0) | 0.13 | Vomiting | 2.0 (2.0-3.1) | 0.19 |
| Male gender | 1.0 (1.0-2.0) | 0.13 | **Recent instrumentation of the biliary tracta** | 2.0 (2.0-3.0) | 0.16 |
| Macroscopic hematuria | 1.0 (1.0-2.0) | 0.13 | Male gender | 1.0 (1.0-2.0) | 0.13 |
| Microscopic hematuria | 1.0 (1.0-1.1) | 0.01 | Increased serum ALT ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum CA19-9 ( > 106 U/ml) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum CA19-9 compared to baseline | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum AST ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum ALP ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum γ-GT ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum conjugated bilirubin ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |

The median rating of each item was calculated and divided into one of three categories: appropriate (6.5-9.0), uncertain (3.5-6.4) and inappropriate (1.0-3.4). IPR indicates the 33rd percentile and 67th percentile of the series of ratings. Consensus was calculated by using the DI (Supplementary Table 2). A DI value < 1 indicates consensus for that item, a value of > 1 indicates no consensus.

*Abbreviations*: IPR, interpercentile range; DI, disagreement index; CT, computed tomography; MRI, magnetic resonance imaging; DWI, diffusion weighted images; CA19-9, carbohydrate antigen 19-9; USG, ultrasonography; ALT, alanine aminotransferase; AST, aspartate aminotransferase; ALP, alkaline phosphatase; γ-GT, gamma-glutamyl transferase; ADC, apparent diffusion value coefficient; SPECT, single photon emission computed tomography; Ga67, gallium-67; ULN, upper limit of normal.

a Items were added by the panel after the first round.

**Supplementary Table 4.** Ratings for each diagnostic item per round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Round 1 (remaining items n=56)** |  |  | **Round 1 (remaining items n=56)** |  |  |
| **Hepatic cyst infection** | **Median (IPR)** | **DI** | **Renal cyst infection** | **Median (IPR)** | **DI** |
| **Appropriate (n=18)** |  |  | **Appropriate (n=21)** |  |  |
| Positive blood culture | 9.0 (8.0-9.0) | 0.13 | Positive blood culture | 9.0 (8.0-9.0) | 0.13 |
| Fever ( > 38.5°C or 101.3 F) | 8.0 (8.0-9.0) | 0.13 | Fever ( > 38.5°C or 101.3 F) | 8.0 (8.0-9.0) | 0.13 |
| 18F-FDG PET/CT showing an increased FDG activity lining a cyst compared to normal parenchyma | 8.0 (8.0-9.0) | 0.13 | 18F-FDG PET/CT showing an increased FDG activity lining a cyst compared to normal parenchyma | 8.0 (8.0-9.0) | 0.13 |
| Absence of any other causes of fever | 8.0 (8.0-9.0) | 0.13 | Absence of any other causes of fever | 8.0 (7.2-9.0) | 0.25 |
| Acute pain in liver area | 8.0 (7.0-9.0) | 0.29 | Unilateral acute flank pain | 8.0 (7.0-9.0) | 0.29 |
| Increased serum CRP ( > 150mg/L or > 15 mg/dL) | 8.0 (6.0-9.0) | 0.49 | CT or MRI detecting gas in a cyst | 8.0 (8.0-8.8) | 0.10 |
| CT or MRI detecting gas in a cyst | 8.0 (8.0-8.8) | 0.10 | Tenderness in renal area | 8.0 (7.0-8.0) | 0.16 |
| Tenderness in liver area | 8.0 (7.0-8.0) | 0.16 | Increased serum WBC ( > 11x109/L or 11.000/µL) | 8.0 (7.0-8.0) | 0.16 |
| Increased serum WBC ( > 11x109/L or 11.000/µL) | 8.0 (7.0-8.0) | 0.16 | Imaging showing changes before and after onset of symptoms | 7.0 (6.2-8.8) | 0.42 |
| Imaging showing changes before and after onset of symptoms | 7.0 (6.0-8.8) | 0.47 | Increased serum CRP ( > 150mg/L or > 15 mg/dL) | 7.0 (6.0-8.1) | 0.39 |
| Clinical response to antibiotic treatment | 7.0 (7.0-8.0) | 0.16 | Clinical response to antibiotic treatment | 7.0 (7.0-8.0) | 0.16 |
| History of cyst infection | 7.0 (7.0-8.0) | 0.16 | History of cyst infection | 7.0 (7.0-8.0) | 0.16 |
| Increased serum CRP ( > 50mg/L or > 5 mg/dL) | 7.0 (6.0-8.0) | 0.37 | Increased serum CRP ( > 50mg/L or > 5 mg/dL) | 7.0 (6.0-8.0) | 0.37 |
| CT or MRI detecting perilesional inflammation of a cyst | 7.0 (6.0-8.0) | 0.37 | CT or MRI detecting perilesional inflammation of a cyst | 7.0 (6.0-8.0) | 0.37 |
| Contrast enhanced CT or MRI showing enhancement in the lining of cyst walls | 7.0 (6.0-7.8) | 0.34 | Recent instrumentation of the urinary tract | 7.0 (6.0-8.0) | 0.37 |
| An immune compromised patient | 7.0 (5.2-7.8) | 0.56 | Recent urinary tract infection | 7.0 (6.0-8.0) | 0.37 |
| MRI detecting fluid-fluid levels in a cyst | 7.0 (6.0-7.0) | 0.22 | CT detecting perinephric inflammatory fat stripes | 7.0 (5.2-8.0) | 0.58 |
| DWI showing a higher density of cyst compared to normal cysts | 7.0 (5.2-7.0) | 0.44 | Positive urine culture | 7.0 (5.0-8.0) | 0.65 |
|  |  |  | Contrast enhanced CT or MRI showing enhancement in the lining of cyst walls | 7.0 (6.0-7.8) | 0.34 |
|  |  |  | An immune compromised patient | 7.0 (5.0-7.8) | 0.63 |
|  |  |  | MRI detecting fluid-fluid levels in a cyst | 7.0 (6.0-7.0) | 0.22 |
| **Uncertain (n=26)** |  |  | **Uncertain (n=21)** |  |  |
| 111In-WBC showing accumulation in a cyst | 6.0 (5.0-7.8) | 0.63 | Acute back pain | 6.0 (5.0-8.0) | 0.65 |
| CT or MRI detecting a thickened cyst wall | 6.0 (6.0-7.0) | 0.22 | CT or MRI detecting a thickened cyst wall | 6.0 (6.0-7.0) | 0.22 |
| CT or MRI detecting heterogeneous content in a cyst | 6.0 (5.0-7.0) | 0.52 | 111In-WBC showing accumulation in a cyst | 6.0 (5.0-7.0) | 0.52 |
| SPECT with Ga67 showing abnormal uptake by a cyst | 6.0 (4.2-7.0) | 0.85 | CT or MRI detecting heterogeneous content in a cyst | 6.0 (5.0-7.0) | 0.52 |
| Marked decrease in ADC on DWI | 6.0 (4.2-6.0) | 0.71 | DWI showing a higher density of a cyst compared to normal cysts | 6.0 (5.0-7.0) | 0.52 |
| Absence of any significant recent intracystic bleeding | 5.0 (5.0-7.0) | 0.52 | Absence of any significant recent intracystic bleeding | 6.0 (5.0-7.0) | 0.52 |
| Increased serum CA19-9 compared to baseline | 5.0 (4.0-7.0) | 0.97 | Macroscopic hematuria | 6.0 (5.0-7.0) | 0.52 |
| USG detecting cellular debris in a cyst | 5.0 (3.2-7.0) | 1.5 | SPECT with Ga67 showing abnormal uptake by a cyst | 6.0 (4.0-7.0) | 0.97 |
| CT detecting a focal high density in a cyst | 5.0 (4.0-6.8) | 0.95 | USG detecting cellular debris in a cyst | 6.0 (3.0-6.8) | 1.50 |
| Increased serum γ-GT ( > 2x ULN) | 5.0 (3.0-6.1) | 1.03 | Marked decrease in ADC on DWI | 6.0 (4.2-6.0) | 0.71 |
| Increased serum ALP ( > 2x ULN) | 5.0 (3.0-6.1) | 1.03 | USG detecting a thickened cyst wall | 6.0 (4.0-6.0) | 0.85 |
| Unilateral acute flank pain | 5.0 (4.0-6.0) | 0.85 | CT detecting a focal high density in a cyst | 5.0 (4.0-6.8) | 0.95 |
| Acute shoulder pain | 5.0 (4.0-6.0) | 0.85 | Dysuria | 5.0 (5.0-6.0) | 0.32 |
| USG detecting a thickened cyst wall | 5.0 (4.0-6.0) | 0.85 | Ongoing hemo-/peritoneal dialysis | 5.0 (4.0-6.0) | 0.85 |
| Ongoing hemo-/peritoneal dialysis | 5.0 (3.0-6.0) | 0.97 | Generalized abdominal pain | 5.0 (3.0-5.0) | 0.52 |
| Increased serum AST ( > 2x ULN) | 5.0 (3.0-6.0) | 0.97 | Microscopic hematuria | 4.0 (2.9-5.1) | 0.58 |
| Increased serum ALT ( > 2x ULN) | 5.0 (3.0-6.0) | 0.97 | >10% unintentional weight loss | 4.0 (3.0-5.0) | 0.52 |
| Increased serum conjugated bilirubin ( > 2x ULN) | 5.0 (3.0-6.0) | 0.97 | USG detecting acoustic enhancement in a cyst | 4.0 (3.0-5.0) | 0.52 |
| CT detecting perinephric inflammatory fat stripes | 5.0 (2.2-6.0) | 1.03 | Loss of appetite | 4.0 (3.0-5.0) | 0.52 |
| Increased serum CA19-9 ( > 106 U/ml) | 5.0 (3.0-5.1) | 0.56 | Malaise | 4.0 (2.9-5.0) | 0.54 |
| Generalized abdominal pain | 5.0 (3.0-5.1) | 0.56 | Acute pain in liver area | 3.5 (2.0-5.0) | 0.65 |
| Acute back pain | 5.0 (3.9-5.0) | 0.35 |  |  |  |
| Malaise | 5.0 (3.0-5.0) | 0.52 |  |  |  |
| USG detecting acoustic enhancement in a cyst | 4.0 (3.0-5.8) | 0.85 |  |  |  |
| >10% unintentional weight loss | 4.0 (3.9-5.1) | 0.40 |  |  |  |
| Loss of appetite | 4.0 (3.0-5.0) | 0.52 |  |  |  |
| **Inappropriate (n=12)** |  |  | **Inappropriate (n=14)** |  |  |
| Nausea | 3.0 (3.0-5.0) | 0.52 | Acute shoulder pain | 3.0 (2.0-5.0) | 0.65 |
| Fatigue | 3.0 (2.0-5.0) | 0.65 | Fatigue | 3.0 (2.0-5.0) | 0.65 |
| Vomiting | 3.0 (2.0-4.0) | 0.37 | Nausea | 3.0 (2.0-4.0) | 0.37 |
| Female gender | 2.0 (1.0-5.0) | 0.75 | Female gender | 2.0 (1.0-4.8) | 0.69 |
| Tenderness in renal area | 2.0 (1.0-4.0) | 0.49 | Tenderness in liver area | 2.0 (1.9-4.0) | 0.39 |
| Recent instrumentation of the urinary tract | 2.0 (1.0-3.0) | 0.29 | Vomiting | 2.0 (2.0-3.1) | 0.19 |
| Recent urinary tract infection | 2.0 (1.0-3.0) | 0.29 | Male gender | 1.0 (1.0-2.0) | 0.13 |
| Dysuria | 2.0 (1.0-2.1) | 0.15 | Increased serum ALT ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
| Positive urine culture | 1.0 (1.0-2.0) | 0.13 | Increased serum CA19-9 ( > 106 U/ml) | 1.0 (1.0-2.0) | 0.13 |
| Male gender | 1.0 (1.0-2.0) | 0.13 | Increased serum CA19-9 compared to baseline | 1.0 (1.0-2.0) | 0.13 |
| Macroscopic hematuria | 1.0 (1.0-2.0) | 0.13 | Increased serum AST ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
| Microscopic hematuria | 1.0 (1.0-1.1) | 0.01 | Increased serum ALP ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum γ-GT ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  | Increased serum conjugated bilirubin ( > 2x ULN) | 1.0 (1.0-2.0) | 0.13 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Round 2 (remaining items n=29)** |  |  | **Round 2 (remaining items n=24)** |  |  |
| **Hepatic cyst infection** | **Median (IPR)** | **DI** | **Renal cyst infection** | **Median (IPR)** | **DI** |
| **Appropriate (n=2)** |  |  | **Appropriate (n=4)** |  |  |
| Fever ( > 38.0°C or 100.4 F)a | 8.0 (8.0-8.1) | 0.02 | Fever ( > 38.0°C or 100.4 F)a | 8.0 (8.0-8.0) | 0 |
| CT or MRI detecting a thickened cyst wall | 7.0 (6.0-7.0) | 0.22 | CT or MRI detecting a thickened cyst wall | 7.0 (6.0-7.0) | 0.22 |
|  |  |  | SPECT with Ga67 showing abnormal uptake by a cyst | 7.0 (6.0-7.0) | 0.22 |
|  |  |  | Acute back pain | 6.5 (5.9-7.0) | 0.25 |
| **Uncertain (n=27)** |  |  | **Uncertain (n=18)** |  |  |
| SPECT with Ga67 showing abnormal uptake by a cyst | 6.0 (6.0-7.0) | 0.22 | 111In-WBC showing accumulation in a cyst | 6.0 (6.0-7.0) | 0.22 |
| 111In-WBC showing accumulation in a cyst | 6.0 (5.0-7.0) | 0.52 | **Scintigraphy with Ga67 showing abnormal uptake in a cysta** | 6.0 (5.0-7.0) | 0.52 |
| CT or MRI detecting heterogeneous content in a cyst | 6.0 (5.0-7.0) | 0.52 | USG detecting cellular debris in a cyst | 6.0 (5.0-7.0) | 0.52 |
| **Recent instrumentation of the biliary tracta** | 6.0 (5.0-7.0) | 0.52 | CT or MRI detecting heterogeneous content in a cyst | 6.0 (5.0-7.0) | 0.52 |
| **Scintigraphy with Ga67 showing abnormal uptake in a cysta** | 6.0 (5.0-6.1) | 0.35 | DWI showing a higher density of a cyst compared to normal cysts | 6.0 (5.0-7.0) | 0.52 |
| Marked decrease in ADC on DWI | 6.0 (5.0-6.1) | 0.35 | Marked decrease in ADC on DWI | 6.0 (5.0-6.1) | 0.35 |
| USG detecting cellular debris in a cyst | 5.5 (5.0-7.0) | 0.52 | USG detecting a thickened cyst wall | 6.0 (5.0-6.0) | 0.32 |
| USG detecting a thickened cyst wall | 5.5 (5.0-6.0) | 0.32 | Absence of any significant recent intracystic bleeding | 5.0 (5.0-7.0) | 0.52 |
| Acute shoulder pain | 5.5 (4.0-6.0) | 0.85 | CT detecting a focal high density in a cyst | 5.0 (5.0-6.0) | 0.32 |
| Increased serum CA19-9 compared to baseline | 5.0 (4.9-6.1) | 0.39 | Dysuria | 5.0 (4.0-6.0) | 0.85 |
| CT detecting perinephric inflammatory fat stripes | 5.0 (3.9-6.1) | 0.94 | Macroscopic hematuria | 5.0 (4.0-5.0) | 0.32 |
| Absence of any significant recent intracystic bleeding | 5.0 (4.9-6.0) | 0.37 | Generalized abdominal pain | 5.0 (4.0-5.0) | 0.32 |
| CT detecting a focal high density in a cyst | 5.0 (4.9-6.0) | 0.37 | Ongoing hemo-/peritoneal dialysis | 5.0 (3.0-5.0) | 0.52 |
| Unilateral acute flank pain | 5.0 (4.9-6.0) | 0.37 | USG detecting acoustic enhancement in a cyst | 4.0 (3.9-5.0) | 0.35 |
| Increased serum γ-GT ( > 2x ULN) | 5.0 (4.0-5.1) | 0.37 | Malaise | 4.0 (3.0-5.0) | 0.52 |
| Malaise | 5.0 (3.0-5.1) | 0.56 | Microscopic hematuria | 4.0 (3.0-4.1) | 0.25 |
| Increased serum ALP ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 | >10% unintentional weight loss | 4.0 (3.0-4.1) | 0.25 |
| Increased serum CA19-9 ( > 106 U/ml) | 5.0 (4.0-5.0) | 0.32 | Acute pain in liver area | 3.5 (2.0-5.0) | 0.65 |
| Generalized abdominal pain | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Increased serum AST ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Increased serum ALT ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Ongoing hemo-/peritoneal dialysis | 5.0 (3.0-5.0) | 0.52 |  |  |  |
| Acute back pain | 4.5 (4.0-5.0) | 0.32 |  |  |  |
| Increased serum conjugated bilirubin ( > 2x ULN) | 4.5 (3.0-5.0) | 0.52 |  |  |  |
| USG detecting acoustic enhancement in a cyst | 4.0 (3.0-5.0) | 0.52 |  |  |  |
| > 10% unintentional weight loss | 4.0 (3.0-5.0) | 0.52 |  |  |  |
| Loss of appetite | 4.0 (3.0-5.0) | 0.52 |  |  |  |
| **Inappropriate (1.0-3.4) (items n=0)** |  |  | **Inappropriate (1.0-3.4) (items n=2)** |  |  |
|  |  |  | Loss of appetite | 3.0 (3.0-4.0) | 0.22 |
|  |  |  | **Recent instrumentation of the biliary tracta** | 2.0 (2.0-3.0) | 0.16 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Round 3 (remaining items n=27)** |  |  | **Round 3 (remaining items n=18)** |  |  |
| **Hepatic cyst infection** | **Median (IPR)** | **DI** | **Renal cyst infection** | **Median (IPR)** | **DI** |
| **Appropriate (n=2)** |  |  | **Appropriate (n=1)** |  |  |
| **Recent instrumentation of the biliary tracta** | 7.0 (5.0-7.0) | 0.52 | 111In-WBC showing accumulation in a cyst | 7.0 (6.0-7.0) | 0.22 |
| 111In-WBC showing accumulation in a cyst | 6.5 (5.0-7.0) | 0.52 |  |  |  |
| **Uncertain (n=25)** |  |  | **Uncertain (n=15)** |  |  |
| CT or MRI detecting heterogeneous content in a cyst | 6.0 (6.0-7.0) | 0.22 | CT or MRI detecting heterogeneous content in a cyst | 6.0 (6.0-7.0) | 0.22 |
| SPECT with Ga67 showing abnormal uptake by a cyst | 6.0 (6.0-7.0) | 0.22 | **Scintigraphy with Ga67 showing abnormal uptake in a cysta** | 6.0 (5.2-6.8) | 0.40 |
| USG detecting cellular debris in a cyst | 6.0 (5.0-6.0) | 0.32 | USG detecting cellular debris in a cyst | 6.0 (5.0-6.8) | 0.48 |
| **Scintigraphy with Ga67 showing abnormal uptake in a cysta** | 6.0 (5.0-6.0) | 0.32 | USG detecting a thickened cyst wall | 6.0 (6.0-6.0) | 0 |
| USG detecting a thickened cyst wall | 6.0 (5.0-6.0) | 0.32 | CT detecting a focal high density in a cyst | 6.0 (5.0-6.0) | 0.32 |
| CT detecting a focal high density in a cyst | 5.5 (5.0-6.0) | 0.32 | DWI showing a higher density of a cyst compared to normal cysts | 6.0 (5.0-6.0) | 0.32 |
| Marked decrease in ADC on DWI | 5.0 (5.0-6.0) | 0.32 | Marked decrease in ADC on DWI | 5.0 (5.0-6.0) | 0.32 |
| Increased serum CA19-9 compared to baseline | 5.0 (5.0-6.0) | 0.32 | Absence of any significant recent intracystic bleeding | 5.0 (3.0-6.0) | 0.97 |
| Unilateral acute flank pain | 5.0 (4.2-6.0) | 0.70 | Generalized abdominal pain | 5.0 (4.0-5.0) | 0.32 |
| CT detecting perinephric inflammatory fat stripes | 5.0 (3.2-6.0) | 0.95 | Ongoing hemo-/peritoneal dialysis | 5.0 (3.2-5.0) | 0.48 |
| Malaise | 5.0 (4.0-5.8) | 0.70 | Dysuria | 4.5 (4.0-5.0) | 0.32 |
| Absence of any significant recent intracystic bleeding | 5.0 (3.0-5.8) | 0.85 | Macroscopic hematuria | 4.5 (3.2-5.0) | 0.48 |
| Increased serum γ-GT ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 | Malaise | 4.0 (3.2-5.0) | 0.48 |
| Increased serum CA19-9 ( > 106 U/ml) | 5.0 (4.0-5.0) | 0.32 | USG detecting acoustic enhancement in a cyst | 4.0 (4.0-4.0) | 0 |
| Increased serum ALP ( > 2x ULN) | 5.0 (4.0-5.0) | 0.32 | > 10% unintentional weight loss | 4.0 (3.0-4.0) | 0.22 |
| Acute shoulder pain | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Generalized abdominal pain | 5.0 (4.0-5.0) | 0.32 |  |  |  |
| Ongoing hemo-/peritoneal dialysis | 5.0 (3.2-5.0) | 0.48 |  |  |  |
| Increased serum AST ( > 2x ULN) | 4.0 (4.0-5.0) | 0.32 |  |  |  |
| Increased serum ALT ( > 2x ULN) | 4.0 (4.0-5.0) | 0.32 |  |  |  |
| Acute back pain | 4.0 (3.0-5.0) | 0.52 |  |  |  |
| Loss of appetite | 4.0 (3.2-4.8) | 0.40 |  |  |  |
| USG detecting acoustic enhancement in a cyst | 4.0 (4.0-4.0) | 0 |  |  |  |
| >10% unintentional weight loss | 4.0 (3.0-4.0) | 0.22 |  |  |  |
| Increased serum conjugated bilirubin ( > 2x ULN) | 4.0 (3.0-4.0) | 0.22 |  |  |  |
| **Inappropriate (n=0)** |  |  | **Inappropriate (n=2)** |  |  |
|  |  |  | Microscopic hematuria | 3.0 (3.0-4.0) | 0.22 |
|  |  |  | Acute pain in liver area | 3.0 (2.0-4.0) | 0.37 |

The median rating of each item was calculated and divided into one of three categories: appropriate (6.5-9.0), uncertain (3.5-6.4) and inappropriate (1.0-3.4). IPR indicates the 33rd percentile and 67th percentile of the series of ratings. Consensus was calculated by using the DI (Supplementary Table 2). A DI value < 1 indicates consensus for that item, a value of > 1 indicates no consensus.

*Abbreviations*: IPR, interpercentile range; DI, disagreement index; 18FDG PET/CT, 18fluorodeoxyglucose positron-emission computed tomography; CRP, c-reactive protein; WBC, white blood cell count; CT, computed tomography; MRI, magnetic resonance imaging; DWI, diffusion weighted images; CA19-9, carbohydrate antigen 19-9; USG, ultrasonography; ALT, alanine aminotransferase; AST, aspartate aminotransferase; ALP, alkaline phosphatase; γ-GT, gamma-glutamyl transferase; ADC, apparent diffusion value coefficient; SPECT, single photon emission computed tomography; 111In-WBC, indium-111 oxine-labeled leukocyte scan; Ga67, gallium-67; ULN, upper limit of normal.

a Items were added by the panel after the first round.

**Supplementary Figure legends**

**Supplementary Figure 1.** Example of a completed Delphi survey of the second round, created using SurveyMonkey® Inc. Palo Alto, CA, USA web-based survey software.

**Supplementary Figure 2.** Response rate of selected experts throughout the Delphi survey.

a Survey only partially completed (n=2)

**Supplementary Figure 3.** Geographical distribution of the experts who completed the third round. World map highlighting the countries represented by the experts. Contrast differences indicate the number of participants per country. Participants per country: the Netherlands (n=8); The United States of America (n=6); Belgium (n=5); Canada (n=2); France (n=2); Spain (n=2); Australia (n=1); Brazil (n=1); Italy (n=1); Japan (n=1); South Korea (n=1).

**Supplementary Figure 4.** Delphi survey procedure for hepatic and renal cyst infection diagnostic items.

**Supplementary Figure 1.**

**ROUND2_example_Pagina_1.tif**

**ROUND2_example_Pagina_2.tifROUND2_example_Pagina_3.tif**

**ROUND2_example_Pagina_4.tifROUND2_example_Pagina_5.tif**

**Supplementary Figure 2.**

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**Supplementary Figure 3.**

Delphi supplement Worldmap.tif

**Supplementary Figure 4.**

delphi figure 2.tif

**Supplementary References**

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