Patient perceptions of replacing CT scan based follow-up with a blood test: acceptability of circulating microRNAs for testicular germ cell malignancy relapse detection

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Background

- MicroRNAs of the miR-371~373 and miR-302/367 clusters are promising biomarkers for blood-based diagnosis and disease-monitoring of malignant germ-cell-tumours (MGCTs)[1-3].
- These microRNA biomarkers have far superior sensitivity/specificity compared with current markers AFP and HCG[4].
- Consequently, circulating microRNA testing may replace serial CT scans in MGCT follow-up[5].
- The acceptability of this approach has not been explored with patients.

Aim

- We aimed to explore patient views of replacing serial CT scans with blood tests for the detection of malignant germ cell tumours.

Materials and Method

- We conducted two focus groups.
- The workshop format consisted of two parts.

1. Interactive presentation describing current markers, new markers, case studies, existing data and economic evaluation (MJM)

2. Focus group (LAF)
- Initial thoughts on test
- Current experience of CT scans
- Overall acceptability of test
- Concerns about blood test versus CT scan

- Transcripts were audio recorded and transcribed. Thematic analysis of transcripts was used to identify key themes/subthemes (LF; SS: MG).

Results

- Twelve participants took part (workshop 1, n=3; workshop 2, n=9); demographic details are shown in Table 1.
- Four main themes were identified which favoured the blood test over CT scans.

1. Sensitivity and safety

- Participants welcomed the increased sensitivity and specificity of the new circulating microRNA test.
- In particular, they welcomed the increased safety of reducing radiation in men who had already experienced cancer and been exposed to chemotherapy.

"If it's as accurate as we hope it is, and we can reduce the number of CT scans, then, yes, we're not exposing patients to radiation that they may not need to have"

2. Costs

- Participants identified reduced costs to the health service and patient.

Health service costs
- Participants discussed the wider health service costs as being more extensive with CT scans & more healthcare professionals being involved.

"…and it's not just the actual scan, is it? It's all the nurses and all the rest of it, and you'll sit and drink your thing and all that. So, that is all a hidden cost…There is a cost to use health service…"

Patient costs
- A reduction in patients costs by taking time off work to go for a CT scan and extended parking costs for the patient were highlighted as a benefit of the blood test which were experienced (by some) to be quicker.

"I know I could go to the hospital and get a blood test done in twenty minutes, I'd only have to pay for my parking. If I'm going in for a CT scan, you know, it's time off work, it's all that other cost as well"

3. Time

- In addition to financial savings, the blood test was felt to be beneficial in terms of time saving for professionals, patients and also the time for results to be returned to the patient.

"my blood test I normally have done on a Monday, and then it's normally in the system by Thursday when I come in for my follow-up. It's a decent turnaround normally"

Table 1: Participant details

Participant details	
Total number participants	12
Current age	26-59 years (mean 42.75)
Age at diagnosis	22-57 years (mean 35.27)
No. of participants with relapse	3
Age at relapse	28-42 years (mean 35)
Tumour Types	
Seminoma	7
Non-seminoma	1
Teratoma	2
Not known	2
Time since last treatment	
<6 months	3
1-2 years	1
>2 years	8
Method of follow up	
Physical examination	3
Markers	8
Chest X-ray	2
CT scan	5
Combination	3
Total number of CT scans	65 (range 1-15, mean 5)

Results (continued)

4. Practicalities

- The process involved in preparing for CT scan *vs.* blood test preparation.

"..if you're having the blue contrast dye, you can't have any liquids, I think, for-, was it eight hours? …It was a time-, So, yes, four to eight hours before the test"

Potential concerns about the blood test versus CT scan

- Some participants perceived the CT scan to have wider diagnostic capacity and potential to pick up things unrelated to their original diagnosis.

"…it would be interesting to see the statistic for following on from a CT scan…how many cases were then picked up where there was something different, unrelated to the original tumour or something, that then was identified through CT scanning…that might have been missed just using blood tests"

- For some participants, the organisation of their service meant receiving results of the blood test could potentially take as long as for CT scans. Additionally, a small number of participants did not like needles.

"Yes, so, they both take time. They both require equal amounts of discomfort, I think. You get used to-, like, I don't like needles, and they faff around trying to vein… and it kills afterwards. So, blood tests for me are not a nice thing"

Conclusions

- The new circulating microRNA blood test was favoured over traditional CT scans - benefits included increased sensitivity/specificity, safety, costs, time and practicalities.
- Variation in service provision of blood tests may mitigate some time-saving aspects for patients and some participants perceived CT scans to have wider diagnostic capacity.
- Education opportunities exist regarding perceived increased diagnostic capacity of CT scans versus additional anxiety and investigations to assess 'coincidentalomas', which are almost invariably of no clinical significance.
- It is likely that use of circulating microRNAs for detection and follow-up of malignant germ cell tumours will be widely acceptable to patients.

1. Murray et al, Am J Clin Path, 2011, PMID 21173133; 2. Syring et al, J Urol, 2015, PMID 25046619; 3. van Agthoven & Looijenga, Oncotarget, 2016, PMID 28938535; 4.Dieckmann et al, Journal Clinical Oncology 2019, PMID 30875280; 5. Murray & Turnbull, Nature Reviews Urology, 2018, PMID 29256490; 6. Charytonowicz et al, Clinical Genitourinary Cancer, 2019, 31155478

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