

‘Blood in Pee Campaign’: Increased demand on secondary care with no change in cancers diagnosed

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Abstract

Objective: As part of the national Be Clear on Cancer campaign, the ‘blood in pee’ campaign was launched in 2013. We aimed to evaluate the impact of the campaign on 2-week wait (2WW) referrals and the resulting diagnoses of malignancy at a single trust, and secondly, to evaluate the socio-economic background of patients referred.

Patients and methods: Suspected cancer 2WW patients in the 3 months pre- and post-campaign were included. Demographics, investigations and diagnoses were recorded. A Kolmogorov–Smirnov test demonstrated a normal distribution. The data were treated as parametric and analysed with the unpaired Student’s t-test.

Results: Referrals for visible haematuria significantly increased by 52% from 135 pre-campaign to 205 post-campaign ($p = 0.03$). There was a fall in the proportion of patients diagnosed with malignancy from 20.27% pre-campaign to 15.36% post-campaign. The mean index of multiple deprivation score of referrals did not change: $p = 0.43$.

Conclusion: This campaign has increased referrals without increasing the proportion of malignancies diagnosed, placing large demand on services without benefit or extra funding. Nor has the campaign effectively reached deprived socioeconomic groups. There is little evidence as to the efficacy of untargeted cancer awareness campaigns and further work is needed to improve their pick-up of malignancies.

Level of evidence: 2C

Keywords: Haematuria, campaign, bladder cancer, oncology (bladder), screening

Introduction

About a quarter of new cases of bladder cancer diagnosed are at a late stage, a concern addressed by NICE in their guidelines highlighting symptoms associated with bladder cancer and the appropriate referral pathway for patients with suspected bladder cancer.(1)

Several public awareness studies have shown that knowledge of symptoms and risk factors for cancer among the general population is poor (2). It is thought that increased awareness of key symptoms of bladder cancer would help earlier detection and improve survival. It is estimated that between 5,000 to 10,000 cancer deaths within 5 years of diagnosis could be avoided each year in England if efforts to promote earlier diagnosis were to be successful (3). In response, the UK Department of Health published “Improving outcomes: A Strategy for Cancer” in 2011. This strategy included public awareness campaigns designed to help people recognise symptoms of concern.

The national “blood in pee” campaign ran from October to November 2013 and was repeated in 2014 and 2016. The key message was: “If you notice blood in your pee, tell your doctor.” The advertising highlights that finding cancer earlier makes cure more likely. The campaign was aimed at men and women above the age of 50 from lower socio-economic groups. This included advertising on television and radio, in newspapers, internet and branded pharmacy bags.

Whilst the ‘Be clear on cancer’ campaign was rolled out across several cancer sites, there have been reports that the campaign did not increase referrals from socio-economic backgrounds where poorer outcomes are more prevalent, and increased referral of the ‘worried well’, having no effect on detection rates (4)(5).

The aim of the present study was to evaluate impact of the campaign on service and diagnosis in a UK centre, and to see whether the campaign reached the targeted the socio-economic background.

Method

All patients referred to the Royal Derby Hospital using the suspected genitourinary tract cancer 2WW pathway 3 months before (June 2013 to August 2013) and 3 months after (November 2013 to January 2014) the initial campaign were identified using the hospital's cancer audit prospectively maintained database. Basic patient demographic data, clinical reason for referral, subsequent investigations, cost analysis and eventual diagnosis were all collected. Patients' postcodes were cross referenced with Indices of Multiple Deprivation (IMD) 2010 scores to identify socio-economic group of the patient (6). The stage of the tumour was also recorded if a diagnosis of bladder cancer was made. Costs were obtained from the hospital's patient level information and costing systems (PLICS). The appropriateness of referrals according to NICE criteria was not assessed.

Data Analysis

A Kolmogorov-Smirnov test was performed on the data, demonstrating a normal distribution. The data were therefore treated as parametric. Data was analysed with the unpaired t-test using Microsoft Excel 2013 (Microsoft, Seattle, USA).

Results

Pre-campaign Demographics

Three hundred and sixty five patients were referred via the 2WW pathway in the 3 months prior to the launch of the national 'blood in pee' campaign. The median age was 66 years (range 19-98) and 73% were men (n=265). The number of people above the age of 50 was 326 (89%). A total of 239 (65%) referrals were for haematuria; both visible and non-visible (135 and 104 respectively). Ninety-three (25.4%) were referred because of elevated age-specific PSA and the rest were due to testicular lump(n=4), haemospermia (n=1), abnormal penile examination (n=11) or urinary tract infection with haematuria (n=7)(Table 1).

Post-campaign Demographics

Four hundred and sixty-one patients were referred via the 2WW pathway in the 3 months following the campaign. The median age was unchanged from pre-campaign at 66 years (range 18-92) and 68% were men (n=313). The number of people above the age of 50 was 414 (90%). A total of 327 (70.8%) referrals were for haematuria; both visible and nonvisible (205 and 122 respectively). One hundred and two patients (22.1%) were referred because of elevated age-specific PSA and 32 patients were referred for other reasons. (Table 1).

The total number of referrals for all reasons increased by 26% and referrals for visible-haematuria increased significantly by 52% ($p=0.03$). NHS England data on GP referrals for suspected urinary tract cancer were analysed for both periods to exclude an effect of seasonal variation on referrals. No effect was found ($p=0.12$)(7).

Table1. Symptoms triggering a 2WW referral for suspected urothelial cancer before and after the first national blood in pee campaign.

Reason for referral	Pre-campaign (n)	Post-campaign (n)
Visible haematuria	135	205
Non-visible haematuria	104	122
Elevated PSA	93	102
Testicular lump	4	2
Haematospermia	1	2
Abnormal penile exam	11	7
Urinary tract infection	7	1
Other	10	20
Total	365	461

Socio-economic factors

The average Index of Measures of Deprivation (IMD) 2010 score before the campaign was 17.09 (range 3.40-65.14) while the average IMD 2010 score for patients after the campaign was 17.9 (range 2.71-65.14). ($p=0.43$). The difference between socio-economic groups was not statistically significant despite the specific stated intention of campaign to target people from lower socio-economic class.

Eventual Diagnosis

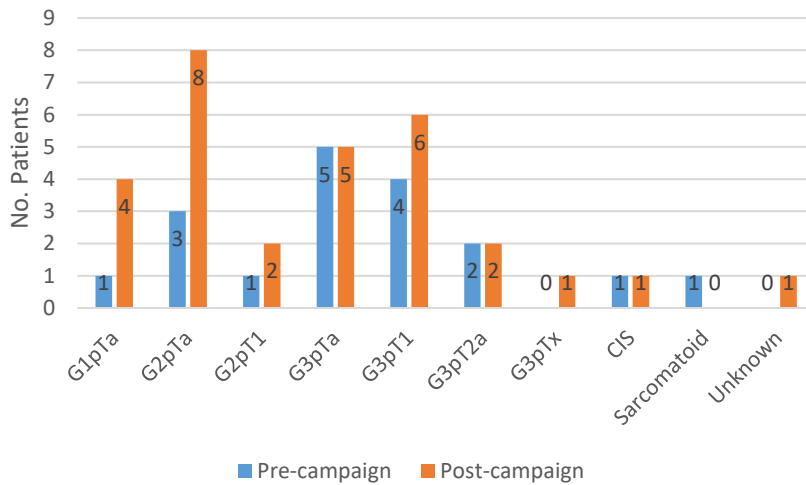
Table2. Eventual diagnosis for all haematuria referrals (NVH and VH)

	Pre-campaign (n)	Post-campaign (n)
Cancer	26	40
Bladder cancer	18	30
Kidney or ureteric cancer	7	10
Other cancer	1	0
No cancer	214	289

There were 18 (20.27%) patients diagnosed with bladder cancer in the 3 months before the national campaign. In the 3 months following the launch, 30 (15.36%) patients were diagnosed with bladder cancer ($p=0.31$) showing a drop in proportion of cancer diagnosed. The pathological stage of these patients is shown in Figure 1. In addition, 7 (5.2%) patients had a diagnosis of renal/ureteric cancer before campaign while 10 (4.6%) patients were diagnosed with same after the campaign. Two

hundred and fourteen patients before and two hundred and eighty-nine patients after the campaign had no cancer diagnosed.

Figure 1. Bladder cancer histological stage at diagnosis

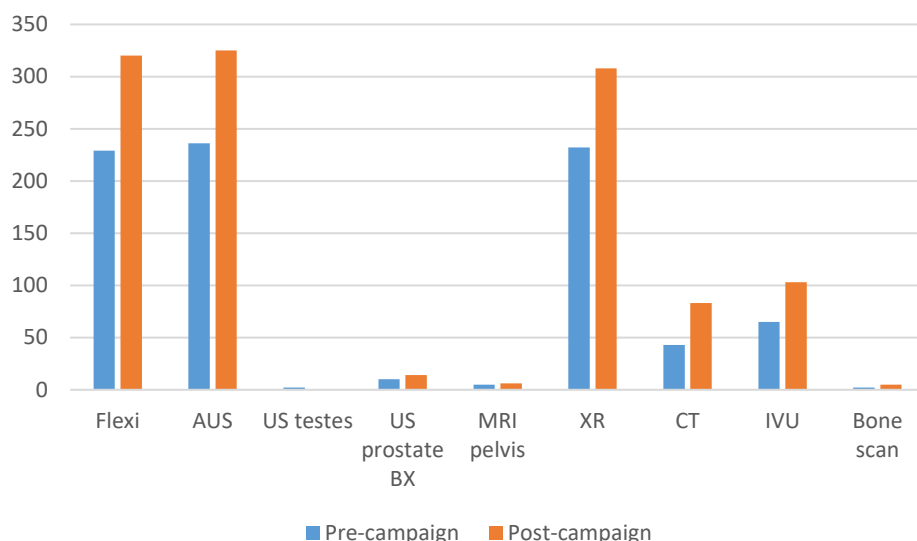


G = grade, T = tumour stage

Investigations and Cost Analysis

Figure 2 and Table 3 show the numbers of investigations performed and associated costs before and after the campaign for all haematuria referrals. Both numbers of investigations and costs increased in the period after the campaign, corresponding to the increase in referrals. £36,212 extra was spent on investigations after the campaign compared to before. Although the total cost increased post-campaign the cost per cancer diagnosed dropped from £3,528 pre-campaign to £3,198 post-campaign, however this is based on a non-significant change in number of cancers diagnosed.

Figure 2. The total number of investigations performed before and after the campaign for all haematuria referrals (NVH and VH)



Flexi = flexible cystoscopy, AUS = abdominal ultrasound, US = ultrasound, MRI = magnetic resonance imaging, CT = computerised tomography, IVU = intravenous urogram

Table3. Costs associated with investigations pre and post-campaign for all haematuria referrals (NVH and VH)

Investigations performed	Pre-campaign (n)	Post-campaign (n)	cost per investigation (£)	Pre-campaign total cost (£)	Post-campaign total cost (£)
Flexible cystoscopy	229	320	401.44	91929.76	128460.8
AUS	236	325	50.19	11844.84	16311.75
US testes	2	0	50.23	100.46	0
US prostate	10	14	313.35	3133.5	4386.9
MRI pelvis	5	6	259.97	1299.85	1559.82
XR	232	308	40.25	9338	12397
CT	43	83	202.87	8723.41	16838.21
IVU	65	103	97.64	6346.6	10056.92
Bone scan	2	5	106.24	212.48	531.2
Overall				91717.28	127929.6

AUS = abdominal ultrasound, US = ultrasound, MRI = magnetic resonance imaging, CT = computered tomography, IVU = intravenous urogram

Discussion

This is the first study to report the impact of the ‘Blood in Pee’ campaign on costs to secondary care. It is also the first to assess the socio-economic group of those patients referred.

We show that the Be clear on cancer “Blood in Pee” campaign significantly increased the number of suspected new cancer referrals with haematuria, but there was no significant change in the diagnosis of bladder or renal tract cancer leading to a drop in proportion of cancers diagnosed. Our

results show a drop in the cost per cancer diagnosed after the campaign however, as the increase in cancers diagnosed was not significant this may devalue this finding making it difficult to draw conclusions from this finding.

In addition, the average Index Measure of Deprivation before and after campaign for both visible and nonvisible haematuria remained unchanged, indicating that the campaign had no effect on its demographic target. Archie et al reported a 92% increase in haematuria referrals with no corresponding significant change in cancer diagnosis in their analysis of the impact of the campaign on a single trust, agreeing with our findings (8).

These findings are in line with examination of the impact of the 'Blood in Poo' campaign for colorectal cancer, again demonstrating increased referral numbers with no change in cancer diagnoses and no change in the socio-economic background of those referred (4). However, Public Health England reported an overall increase in cancer detection rate from pilot studies (9), something not found in our data.

The campaign met its stated objective of increasing the number of people being referred for visible haematuria which increased significantly by over a half. Referral for nonvisible haematuria also increased by a more modest 17.3%. This increase in visible haematuria referrals would imply an increased awareness of the signs of urological cancer, and thus success of the mass educational aspect of the campaign.

While the criteria for referral for visible haematuria are straight forward, the criteria for nonvisible haematuria are slightly more complex and the increase would imply an increase in primary physician awareness about the haematuria referral guidelines, possibly increased furthermore by exposure to the campaign (leaflets in the workplace, screensavers on work computers etc) rather than patients themselves seeking attention, non-visible haematuria not alerting patients to a problem by definition. We did not however formally audit whether the patient and/or primary physician was aware of the campaign at time of diagnosis, which if collected may have allowed us to draw a more 'cause and effect' conclusion.

The main limitation to this study is that it represents a single centre experience, albeit with a large catchment population of 600,000. The Bladder cancer arm of this campaign is no longer live however other cancers are continuing to be targeted underneath the same campaign title of 'Be Clear on Cancer' and thus ongoing analysis of these campaigns is worthwhile.

Conclusions

In conclusion, while visible haematuria is considered a reliable predictor of underlying urological malignancy and while this mass media campaign did increase the number of referrals for visible haematuria, it failed to achieve its objective of increasing referrals from lower socio-economic groups and has also failed to significantly increase in the number of urothelial and renal cancers diagnosed. There is little evidence as to the efficacy of current untargeted cancer awareness campaigns and further work is needed in order to improve their pick up of undiagnosed malignancies.

References

1. Suspected cancer: recognition and referral | Guidance and guidelines | NICE [Internet]. [cited 2017 Dec 23]. Available from: <https://www.nice.org.uk/guidance/ng12/chapter/1-Recommendations-organised-by-site-of-cancer#urological-cancers>
2. Robb K, Stubbings S, Ramirez A, Macleod U, Austoker J, Waller J, et al. Public awareness of cancer in Britain: a population-based survey of adults. *Br J Cancer*. 2009 Dec 3;101(Suppl 2):S18–23.
3. Richards MA. The size of the prize for earlier diagnosis of cancer in England. *Br J Cancer*. 2009 Dec 3;101(Suppl 2):S125–9.
4. Hall SJ, Peacock JDH, Cochrane LA, Peacock O, Tierney GM, Tou SIH, et al. The bowel cancer awareness campaign ‘Be Clear on Cancer’: sustained increased pressure on resources and over-accessed by higher social grades with no increase in cancer detected. *Colorectal Dis Off J Assoc Coloproctology G B Irel*. 2016 Feb;18(2):195–9.
5. Peacock O, Clayton S, Atkinson F, Tierney GM, Lund JN. ‘Be Clear on Cancer’: the impact of the UK National Bowel Cancer Awareness Campaign. *Colorectal Dis Off J Assoc Coloproctology G B Irel*. 2013 Aug;15(8):963–7.
6. 1871208.pdf [Internet]. [cited 2018 Jan 21]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6871/1871208.pdf
7. Statistics » Monthly Hospital Activity Data [Internet]. [cited 2017 Dec 23]. Available from: <https://www.england.nhs.uk/statistics/statistical-work-areas/hospital-activity/monthly-hospital-activity/mar-data/>
8. Hughes-Hallett A, Browne D, Mensah E, Vale J, Mayer E. Assessing the impact of mass media public health campaigns. Be Clear on Cancer ‘blood in pee’: a case in point. *BJU Int*. 2016 Apr;117(4):570–5.
9. evaluation_results_2014.pdf [Internet]. [cited 2017 Dec 23]. Available from: https://www.cancerresearchuk.org/sites/default/files/evaluation_results_2014.pdf