Recurrent Haematuria In Pregnancy: A Case Report And A Review Of The Literature

Author(s): Dr. Anthony Venyo

Corresponding Author:
Dr. Anthony Venyo,
Urologist, Urology Department. North Manchester General Hospital, M8 5RB - United Kingdom

Submitting Author:
Dr. Anthony K Grey Venyo,
Urologist, Urology Department. North Manchester General Hospital, North Manchester General Hospital, Department of Urology, ManchesterM8 5RB, United Kingdom, M8 5RB - United Kingdom

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Abstract

Background
An otherwise uneventful pregnancy may occasionally be complicated by spontaneous gross or microscopic haematuria. The differential diagnosis of haematuria during pregnancy includes all the causes of haematuria in non-gravid patients. If investigation confirms the absence of any of the known causes of haematuria in the non-pregnant patient then the haematuria is labelled as “Idiopathic” and is explained by the peculiar changes in the urinary tract which has been induced by mechanical and hormonal factors related to pregnancy. Such a pregnancy induced haematuria is almost invariably associated with spontaneous and complete resolution of the haematuria after delivery of the baby and the haematuria may or may not recur in future pregnancies. Gross spontaneous haematuria may result in anxiety for a pregnant lady and an obstetrician who had not managed a pregnant lady with gross haematuria before. Medical practitioners need to be up to date with the investigation and management of haematuria in pregnancy.

Objectives
To report a case of intermittent gross haematuria in an elderly primip and to review the literature on haematuria in pregnancy

Case Report
A 38-years-old lady presented with a history of recurrent gross haematuria when 24 weeks into her first pregnancy. Her examinations and investigations including; urine microscopy and culture and sensitivity; urine cytology; full blood count; serum urea and electrolytes; liver function tests; coagulation screen; ultra-sound scan of her renal tract/abdomen and pelvis did not reveal anything to account for the haematuria. The haematuria settled. She was listed to subsequently have flexible cystoscopy but she failed to attend for the cystoscopy as well as follow-up appointment in the out-patients clinic six months later. Literature review revealed: that most cases of haematuria are idiopathic even though other causes of haematuria in the absence of pregnancy can occur; haematuria in pregnancy may be explained by the “Nutcraker Phenomenon” and the haematuria usually spontaneously settles.

Conclusions
In a majority of cases of haematuria in pregnancy, no demonstrable cause can be found after investigations and the bleeding spontaneously subsides in the postpartum. The haematuria events are explained by rupture of small veins around the dilated renal pelvis in pregnancy. It is worthwhile realising that, investigations of gestational associated haematuria almost invariably can be deferred until after delivery of the baby. Non–invasive investigative techniques like ultrasound scan and MRI are useful in arriving at such decisions

Key words: Haematuria; Pregnancy; “Nutcraker Phenomenon”; Idiopathic; ultrasound scan.

Introduction
Haematuria in pregnancy is classified as “Idiopathic” only after non invasive diagnostic techniques including blood and urine tests, ultrasound scan and at times magnetic resonance imaging have confirmed the absence of organic causes of haematuria.

Pregnancy associated spontaneous idiopathic haematuria which resolves in the post natal period is explained by changes in the renal tract in pregnancy. Danielli and associates (1) suggested that hormonal and mechanical factors of pregnancy result in renal vein varicosities (tortuosity and dilatation) in the region of the upper ureter and renal pelvis and this causes haematuria. Danielli and associates (1) also stated that the fact that hormones alone can cause haematuria has been proven by the observation that oral contraceptive pills (pseudo-pregnancy) have been known to be associated with pregnancy. Progesterone and oestrogen promote atonia, relaxation as well as dilatation of the smooth muscles of the renal tract which results in stasis and infection. It has been suggested that stasis causes undue pressure on the fornix of the renal calyces resulting in the formation of abnormal communications between the renal calyces.
and submucosal venous sinuses which is followed by haematuria (2). Considering the aforementioned suggested aetiology of spontaneous idiopathic haematuria in pregnancy, it would be conjectural to suggest that idiopathic spontaneous haematuria would be more common in polyhydramnios and multiple pregnancies in comparison with single pregnancy but there has not been any studies comparing the incidence of haematuria in single pregnancies with those of polyhydramnios and multiple pregnancies.

Case Report

A 38-years-old primigravida was referred by her General Practitioner because of persistent/recurrent macroscopic haematuria which had been recurrent over a period of two weeks. She developed painless gross haematuria at 22 weeks of gestation. The haematuria started as frank specs of blood in her urine and this persisted for a few days and then recurred intermittently up to the 24th week of gestation. She did not have any dysuria or urinary frequency. She admitted to being a smoker. She had no medical problems and was not on any medications. On examination she was found to be haemodynamically stable and normotensive without any evidence of pallor. Her General and systematic examination were unremarkable. There was no evidence of any tenderness on abdominal examination. Her fundal height was commensurate with her period of gestation. Foetal movements were felt and it was felt that her pregnancy was progressing smoothly. There was no evidence of urethral caruncle on vaginal examination and no evidence of bleeding from the cervix.

Her investigations included:

- Urine microscopy and culture.
- Urine cytology.
- Full blood count.
- Serum urea and electrolytes.
- Coagulation screen.
- Ultra-sound scan of renal tract and abdomen as well as pelvis.

It was explained to her that the haematuria would eventually resolve in the absence of any organic cause and she would be treated expectantly adopting a conservative approach.

At follow-up four weeks later (when she was 28 weeks pregnant) she reported no further significant haematuria; her investigations were reported as follows:

- Ultrasound scan of renal tract was normal.
- Urine cytology was normal (this showed squamous cells and no malignant cells).
- Urine culture did not grow any organism; and the urine white cell count and red blood cell counts determined by flow cytometry were 10/uL (normal range 0 – 40 u/L) and 20u/L (normal range 0 – 35 u/L) respectively.
- Her full blood count results - Haemoglobin 10.6 g/dl (normal range 11.5 – 16.5 g/dl); White blood cell count 10.2 x 10^9/L (normal range 4-11 x 10^9/L); platelet count 285 x 10^9/L (normal range 150-450 x 10^9/L).
- Liver function tests were normal
- Coagulation screen were normal
- Serum urea and electrolytes were normal.

She was reassured that her investigations were normal but she would need to have a flexible cystoscopy subsequently to complete her investigations and she was listed to have flexible cystoscopy.

She did not attend for the flexible cystoscopy and she failed to attend for follow-up six months later because her haematuria had settled and she did not want any further investigation.

Discussion

A number of clinical points that need to be taken into consideration in the investigation of haematuria include the following:

- Pelvic examination is useful in localising the source of bleeding by differentiating renal tract bleeding from genital tract bleeding; in doubtful cases a catheter specimen of urine may be obtained (3).
- In microscopy of mid-stream specimen of urine, the upper limit of normal is 1-2 red blood cells per high power field using semi-quantitative technique and 8000 red blood cells per ml using a counting chamber (4).
- Urine microscopy may confirm presence or absence of schistosoma haematobium ova in the urine.
- Urine specimen should be sent for culture and sensitivity and in case of evidence of urinary tract infection adequate treatment should be given based upon antibiotic sensitivity.
- Urine cytology would help exclude atypical cells or malignant cells.
- Coagulation screen is a useful test to exclude correctable coagulation problems.
- Ultrasound scan of renal tract which is not invasive should be used to exclude organic causes of haematuria to arrive at a diagnosis of idiopathic haematuria; Occasionally Magnetic Resonance Imaging may be used.
- Cystoscopy would help in finding out organic causes of haematuria and would also localise the source of bleeding whether bladder or ureter and which ureter
In 1972, De Schepper attempted to explain the phenomenon of idiopathic haematuria by using the “Nutcracker theory” (8). The left renal vein is subject to compression between the abdominal aorta and superior mesenteric artery resulting in resistance to venous outflow in the left renal vein. This leads to the development of an extensive collateral venous drainage system involving the gonadal capsular, suprarenal, lumbar, azygous and periureteral veins (9). The extensive renal varicosities emanating from these collaterals gives rise to haematuria following their rupture into the renal calyces. This is diagnosed on renal angiography and venography and this can be corrected by medial fixation of the kidney (to decrease stretch on the renal vein) and excision of renal varicosities (9).

In this particular case the patient did not want any further investigation in view of the fact that her symptoms had settled and her investigations including: urine cytology; urine culture and urine flow cytometry; ultrasound scan of renal tract; full blood count; serum urea and electrolytes; liver function tests; and coagulation screen were normal. It would be argued it would be argued that flexible cystoscopy should have been done to complete her investigations to exclude any small bladder lesion but the patient did not want any further investigation. It would also be counter argued that if the lady had any big any significant lesion in the urinary bladder the ultrasound scan would have picked the lesion up therefore flexible cystoscopy was not absolutely necessary and that it would be sufficient to leave the lady alone to come back in the event of any further haematuria. The cause of haematuria was not established in this case however, it could be suggested that in the absence of any obvious pathology found during ultrasound scan of the patient’s gross haematuria may be considered provisionally to be related to the “Nutcracker Phenomenon” but to be absolutely sure if her haematuria subsequently recurs in the absence of pregnancy or during any subsequent pregnancy she would need to have further investigations including: cystoscopy and bilateral ureteric urine sampling / bilateral retrograde ureterogram / bilateral ureteroscopies; renal angiography to exclude any rare cause of haematuria to complete her investigations at a time that she is not pregnant.

In a majority of cases of haematuria in pregnancy, no demonstrable cause can be found after investigations and the bleeding spontaneously subsides in the

(5). Flexible or rigid cystoscopy may confirm the presence or absence of tumour or stone in the bladder or blood exuding from one or both ureteric orifices. Rarely, it may be necessary to do ureteric catheterisation for urine sampling for microscopy, culture and sensitivity as well as for retrograde ureteropyelogram. In the case where urine is seen to be exuding from one ureter and retrograde ureteropyelogram is normal, then ureteroscopy is a useful way of excluding a small lesion in the upper renal tract.

• If haematuria recurs in a subsequent pregnancy when all investigations have been normal then selective renal angiography may be indicated in the post natal period to exclude an arterio-venous malformation

Some of the causes to be excluded in the differential diagnosis of haematuria in pregnancy include: calculi; tumours; renal parenchymal disease; trauma; bleeding and coagulation disorders; drugs; renal vein thrombosis and emboli; endometriosis (4; 6). After exclusion of organic causes of haematuria in pregnancy, there would still be a number of cases for which a definite cause of bleeding cannot be found by routine clinical and urologic examination and these cases would be classified as idiopathic.

Brown and associates (7) reported that one thousand pregnant women who attended for routine antenatal care in St George hospital and university of New South Wales in Australia were invited to have a routine urinalysis and be referred to a nephrology clinic for further investigation if dipstick microscopic haematuria was detected on more than one occasion before 32 weeks gestation. In this study the main outcome measures were the prevalence of dipstick haematuria confirmed by urine microscopy, and the development of preeclampsia or gestational hypertension or delivery of a small-for-gestational–age baby. One hundred and seventy eight of 902 women (20%) who entered the study had dipstick haematuria on at least 2 occasions in pregnancy; 66 of 126 women (53%) who had haematuria before 32 weeks attended the nephrology clinic, where microscopic haematuria was confirmed in 40 women (61%). Renal imaging results were normal in all except 1 woman, and all women had serum creatinine level of 0.90 mg/dl or less (< or = 80 micromol/L). The development of preeclampsia or gestational hypertension or the delivery of a small-for-gestational–age baby, were similar in women with and without dipstick haematuria. Microscopic haematuria persisted in half (15 women) of those who attended for follow-up after 3 months post partum.

Brown and associates concluded that:

(a) Dipstick haematuria is very common during pregnancy, but rarely signifies a disorder likely to impact on the pregnancy outcome.

(b) Post partum follow-up be recommended to detect women who have persistent haematuria and be presumed to have underlying glomerulonephritis (7).
postpartum. The haematuria events are explained by rupture of small veins around the dilated renal pelvis in pregnancy. It is worthwhile realising that, investigations of gestational associated haematuria almost invariably can be deferred until after delivery of the baby. Non-invasive investigative techniques like ultrasound scan and MRI are useful in arriving at such decisions (9; 10).

If there is absence of a demonstrable cause of haematuria in pregnancy, then the haematuria is classified as idiopathic and recurrence is said to be unlikely in the current or subsequent pregnancy (6).

Conclusions

- In a majority of cases of haematuria in pregnancy, no demonstrable cause can be found after investigations and the bleeding spontaneously subsides in the postpartum.
- The haematuria events are explained by rupture of small veins around the dilated renal pelvis in pregnancy.
- Investigations of gestational associated haematuria almost invariably can be deferred until after delivery of the baby.
- Non-invasive investigative techniques like ultrasound scan and MRI are useful in arriving at such decisions.
- Midwives, General practitioners, obstetricians as well as urologists need to be aware of the e approach to gross haematuria in pregnancy in order to reassure the patients and in order to guide these patients through their pregnancies.

References


Author details

Anthony Kodzo-Grey Delali Venyo
North Manchester General Hospital
Department of Urology
Delaunays Road
Crumpsall
Manchester
M8 5RB
UNITED KINGDOM
TEL: ++44 (0) 161 7202468

Correspondence to:
Mr A K-G Venyo MB ChB FRCS(Ed) FRCSI LLM
North Manchester General Hospital
Delaunays Road
Crumpsall
Manchester
M8 5RB
United Kingdom
E Mail: akodzogrey@yahoo.co.uk
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