Learning Point for Clinicians

Turner syndrome (TS) is associated with a reduction in life expectancy of up to 13 years compared to that of the general population, with cardiovascular disease, congenital or acquired, as the major cause of an early death. Therefore, women with TS require rigorous, long-term medical follow-up and careful monitoring for cardiovascular risk factors. Early identification of aortic root dilatation, allowing appropriate medical intervention, may prevent aortic dissection and rupture, reducing cardiovascular morbidity and mortality.

Case report

A 23-year-old childcare assistant, with known TS (45XO), was referred to our cardiovascular risk clinic for hypertension (HTN) management. Reviewing her medical history, she had congestive heart failure at 1 month of age, secondary to coarctation of the aorta (CoA), for which she underwent a left subclavian flap aortoplasty. At 3 years of age, surgical correction of neck webbing was undertaken, followed by a repair of cleft palate and pharyngoplasty. She declined growth hormone replacement and started oestrogen replacement at 12 years old. Prior to referral to our clinic, the combined oral contraceptive pill (cOCP) had been stopped and she had started amlodipine 10 mg once daily.

On examination her height was 133 cm, weight 81 kg and body mass index (BMI) 45.3 kg/m². Her clinic blood pressure (BP) was raised at 141/79 mmHg, confirmed by ambulatory BP monitoring (ABPM). Heart sounds were normal, her chest was clear and pitting pedal oedema was present bilaterally. An echocardiogram revealed no valvular abnormalities but possible coarctation of the descending aorta. However, magnetic resonance imaging (MRI) identified a bicuspid aortic valve (BAV), although with no significant stenosis (Figure 1a). Residual luminal narrowing at the site of previous coarctation repair was noted, but no related limitation of flow was seen. Aortic dilatation was not present, and the aortic size index (ASI) was 1.6 cm/m². A horseshoe kidney, with dilatation of the
pelvicalyceal system, was also noted (Figure 1b) but was not obstructed, and renal function was normal. Candesartan was added to optimize BP. Amlodipine was then reduced because it was thought to have caused pedal oedema, and substituted by chlortalidone. Unfortunately, chlortalidone precipitated hypokalaemia, so amiloride was added, as an additional anti-hypertensive agent to control BP. Now, 18 months on, her BP is 126/72 mmHg. Following the diagnosis of HTN, she was prescribed physiological hormone replacement (transdermal oestrogen and vaginal progestogen), but unfortunately was unable to tolerate the transdermal preparation due to local pruritus. Now that BP is well controlled, she has started a standard low-dose combined hormone replacement.

Discussion

TS is associated with a reduction in life expectancy of up to 13 years compared with that of the general population, and the major causes of premature mortality are congenital cardiovascular defects, which affects up to a half of women with TS. BAV is the most common congenital defect and is seen in ~30% of women. Transthoracic echocardiography (TTE) is the primary test for BAV, but TTE can miss some cases and cardiac MRI should be used if clear visualization of the aortic valve is not obtained. CoA affects ~12% of women with TS and restenosis remains a risk even after surgical repair. HTN is reported in up to half of women with TS, and an elevated clinic BP (>140/90) should be confirmed with 24-h ABPM. There is limited guidance on the treatment of HTN in women with TS. Hormone replacement can be challenging given the high prevalence of HTN, but physiological replacement is associated with less activation of the renin–angiotensin system and a lower BP. Obesity often affects women with TS and all women should be given lifestyle and dietary advice, aiming for a BMI of ≤25 kg/m². Congenital malformations of the urinary tract affect ~30% of women, and increase the risk of pyelonephritis or pelviureteric obstruction. A renal ultrasound should be performed at diagnosis, and renal function closely monitored.

Undoubtedly, the most serious complication for women with TS is aortic dissection, which is 100 times more common than in the general population. BAV, CoA and HTN are major risk factors for aortic dilatation and dissection. Careful reassessment of the cardiac valves and aorta should be performed every 3–5 years by MRI. ASI is the preferred method to determine the degree of dilatation, because it normalizes the aortic diameter to
body surface area.\(^2\) If dilatation is identified, ABPM should be performed to ensure that BP is lowered sufficiently (<130/80 mmHg) and more regular radiological imaging should be arranged (every 1–2 years) to aid any decision on surgical management.\(^2\) In addition, younger women with TS should be advised to attend the emergency department on experiencing sustained chest pain, as they generally delay seeking medical help for aortic dissection, reducing survival.\(^6\)

In summary, this case stimulated reflection on our management of cardiovascular risk in adult women with TS. Subsequently, we assembled a dedicated multidisciplinary group to determine a cardiovascular screening strategy and a HTN management plan.\(^2\) It is extremely important that a robust screening programme is in place for these women to identify and address these potentially life-threatening complications.

Conflict of interest: None declared.

References