CASE REPORT

A case report of acute myelogenous leukemia with Turner Syndrome

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Abstract

Turner Syndrome was diagnosed in a 45 years old female, known case of Acute Myeloid Leukaemia (AML) with maturation, on Bone Marrow biopsy. She presented with blurred vision, vertigo, exertional dyspnoea and insomnia. She did not show the typical features of Turner syndrome, but her cytogenetis confirmed the diagnosis. Bone marrow biopsy showed diffuse infiltration of blast cells with cellularity around 80-85% and haematopoietic suppression. Karyotype analysis showed: 45 X, -X, t (8; 21) (q22; q22) [According to The International System for Human Cytogenetic Nomenclature (ISCN)].

Turner syndrome is caused by partial or complete absence of second X chromosome in a female. It is known to have Cardiovascular and Reproductive complications but it is rare to find haematologic malignancies. There are few similar reported cases of AML associated with Turner syndrome, therefore this is a unique case presented to Jinnah Postgraduate Medical Center, Karachi, Pakistan and further research should be done to identify more similar cases to explore the prognostic significance of this association.

Keywords: Syndrome, Acute Myeloid Leukemia, Karyotyping, Turner.

Introduction

Turner Syndrome is an X chromosome monosomy, only full monosomy viable in humans, seen only in females with karyotype XO.[1] It affects 1 in 2500 live births making it one of the most common aneuploidy in females.[2]

Turner syndrome is associated with early loss of ovarian function, arresting puberty and development, leading to short stature and other pathognomonic features of the diseases. There are numerous well established complications of the disease affecting cardiovascular, renal, endocrine systems most prominently.

Haematopoietic anomalies that were found to be associated with Turner are Iron deficiency anaemia, congenital erythroid hyperplasia, acute lymphoblastic leukaemia, acute myelogenous leukaemia and PH-positive chronic myelogenous leukaemia.[3-6] We are reporting a case of Acute Myelogenous Leukaemia M2 (Acute Myelogenous leukaemia with maturation) associated with Turner Syndrome.

There is no cure to Turner syndrome. Affected individuals are given growth hormone injections along with Estrogens to increase height and development of breasts and hips. Further care is given to manage other health problems associated with the disease.

Case Report

A 45 years old female, Hepatitis C positive, came on 14th June, 2016 to Jinnah Post Graduate Medical Center, with the complaint of blurred vision, vertigo and sleep deprivation since 3 months. 6 days ago, she noticed multiple pinpoint red lesions all over the body; she also reported shortness of breath with minimal exertion for which she was referred to National Institute of Blood Disease for Bone Marrow D/R and Trephine biopsy.

Morphology showed normochromic, anisocytosis, Rouleaux formation, circulating blast cells with Auer rods, bicytopenia with leukocytosis, neutrophils: 0.7%, lymphocytes: 23%, monocytes: 03%, Blasts: 67%.

On marrow aspirate, predominant population of blast cells were seen which were medium in size, round to oval in shape, having regular cellular margins, intermediate to high N/C ratio, slightly granular cytoplasm, irregular nuclear margins with in-foldings, open chromatin pattern and prominent nucleoli. Numerous small particles in reticulum cells were seen on iron stain. MPO stain showed positivity in > 3% of Blast cells. Trephine biopsy showed cellularity of around 80-85%, Trilineage haematopoiesis was markedly suppressed. There was diffuse infiltration by blast cells.

She was diagnosed with Acute Myeloid Leukaemia with maturation (according to WHO classification of 2008) and was admitted in Jinnah Post-Graduate Medical Centre on 14th August for Chemotherapy. Her Echo showed normal sized LV with normal function, normal valves, and grade-1 diastolic dysfunction. She was induced with Daunorubicin 50 mg/m2/ day-IV and Cytarabine 100 mg/ m2/ day- IV.

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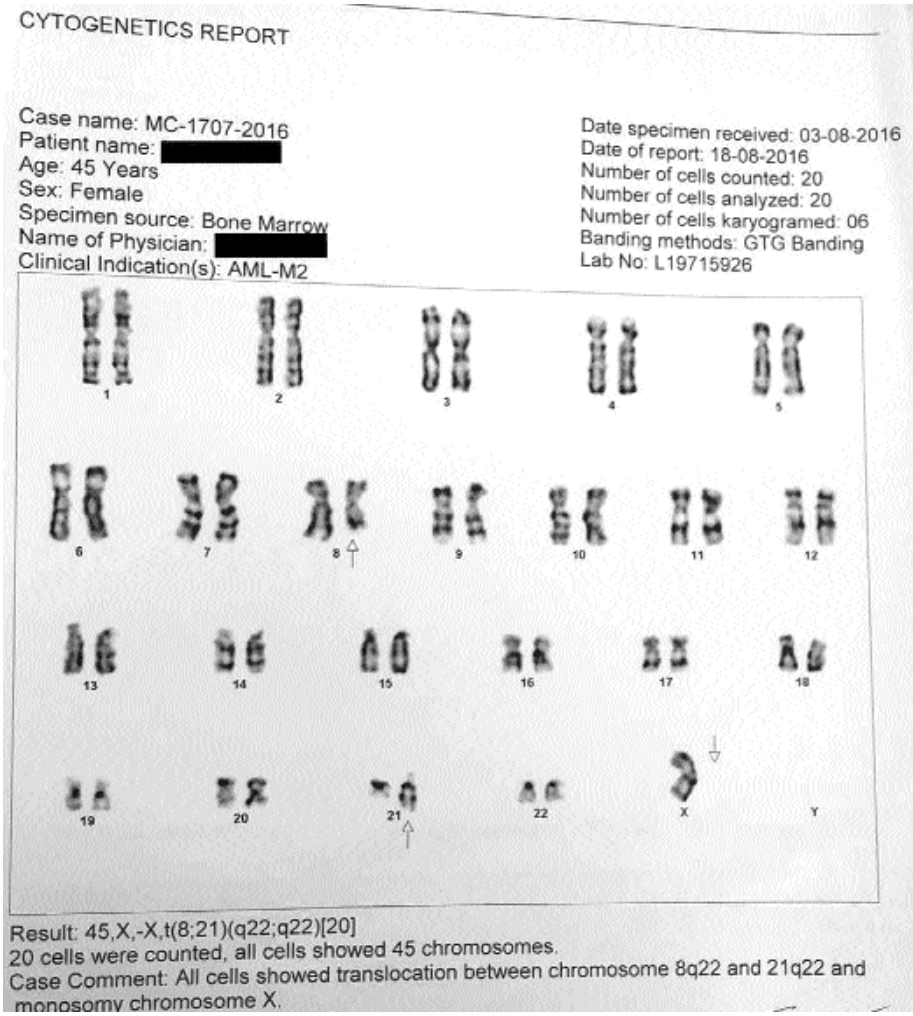

Figure: Karyotype analysis.

Past history included primary amenorrhoea for which no work-up was done. On physical examination she was found to be pale and had petechiae all over the body. She did not have webbed neck, low set ears, and swollen hands. Her height was measured to be 152 cm and weight of 71 kg and BMI of 30.73. Her brother was of normal height and weight.

Her Labs on initial visit were as follows:

Hb- 7.8 G/dl, RBC Count 2.92 x1012/L, PCV: 24%, MCV: 84 fl, MCH: 26 pg, MCHC: 31 G/dl, TLC: 12.81x 109/L, Lymphocytes: 23%, Monocytes: 03%, Blasts: 67%, Platelets 06 x109/ L.

Serum electrolytes were normal.

Abdominal ultrasound showed hepatosplenomegaly.

On admission her labs were:

Hb-11 g/dl, MCV: 73%, Platelets: 25 $x10^9$/L, WBC: 18.01 $x10^9$/L

Echo showed normal sized LV with normal function, normal valves, and grade-1 diastolic dysfunction

After starting Chemotherapy:

Hb- 8.4 g/dl, MCV: 74.2%, Platelets: 35 x 10^9/L, WBC: 17.90 $x10^9$/L

For further studies, she underwent karyotype analysis and the result showed: 45 X, -X, t(8; 21) (q22; q22) [According to The International System for Human Cytogenetic Nomenclature (ISCN)] (Figure).

Discussion

The cardinal features of Turner syndrome are short stature and gonadal dysgenesis, other commonly associated morphologic defects include webbed neck, widely spaced nipples with shield chest, high arched palate, low posterior hairline, short fourth metacarpal, low set ears, peripheral lymphedoema and scoliosis. Major cardiovascular anomalies associated with Turner syndrome are transverse aortic arch, coarctation of aorta, bicuspid aortic valve and partial anomalous pulmonary venous return. Major renal anomalies are horse-shoe shaped kidneys, renal agenesis and duplicated collecting ducts. This patient's primary complain of amenorrhoea signifies the importance of early diagnostic workup of any patient with infertility which can help to unmask undiagnosed major medical diseases including Turner Syndrome.

Although Turner Syndrome is well known for its cardiovascular, renal, endocrinologic and reproductive complications,[7] cases of Turner Syndrome associated with haematologic anomalies are very rare and only few were reported for example, case of Turner syndrome with T-large granular lymphocyte leukaemia (T-LGL), one with coexistence of chronic lymphocytic leukaemia (CLL) and idiopathic myelofibrosis (IMF) and one with AML-M2.Turner Syndrome is reported to be more commonly associated with multiple benign and malignant tumours.[8,9]

Since our patient showed very few of the above mentioned complications including amenorrhoea, and went into remission after induction with chemotherapy, she should be enrolled for long term surveillance for regular blood counts with peripheral smears, serum oestrogen and progesteron, U/S abdomen and pelvis, and risk factor reduction strategy should be modeled. Such patients should be counseled about the complications of Turner syndrome and asked to report back immediately if any new symptom appears.

Downs syndrome is found to be closely linked to Acute Myelogenous Leukaemia.[10] Considering Trisomy 21 as one of the chromosomal disorder associated with Leukaemia, further studies should be conducted to define association of various leukaemias with Turner Syndrome. It will not only give us the idea of the magnitude of the epidemiologic burden of the disease but also help us to screen patients with Turner syndrome for having Acute leukaemia and study prognostic significance of such association.

Conclusion

As the researches have shown that chromosomal anomalies are associated with malignancies, this case of Acute Myelogenous Leukaemia in Turner Syndrome highlights the fact that more researches should be done to uncover more cases of such association and further explore if there's any difference with respect to the disease occurrence and prognosis.

Consent: Consent has been taken from the patient.

Disclaimer: The abstract has not been previously presented or published in any conference. The manuscript was not part of any research, PhD or thesis project.

Conflict of Interest: There were no financial, professional or personal interest that could have influenced the work.

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References

1. Gourgari E, Winer, K. "Turner Syndrome: Overview". Aug, 23, 2013.
2. Sybert VP, McCauley E.Turner's Syndrome. N Engl J. Med. 2004; 351: 1227-38.
3. Wertelecki W, Shapiro JR. 45, XO Turner's syndrome. J Korean Soc Endocrinol. 2005; 20: 160-7.
4. Takeshita A, Shinjo K, Yamashita M, Fujisawa S, Naito K, Ohnishi K, et al. "Extensive cytogenetic studies of clonality following interferon-alpha therapy in chronic myeloid leukemia occurring in monosomic cells in a patient with Turner syndrome mosaic". Leukemia. 1999; 13: 1749-53.
5. Manola KN, Sambani C, Karakasis D, Kalliakosta G, Harhalakis N, Papaioannou M. "Leukemias associated with Turner syndrome: report of three cases and review of the literature" Leuk Res. 2008; 32: 481-6.
6. Patroglu T, Torun YA, Karakukcu M, Gorozen F. "A case of Turner syndrome associated with acute myeloid leukemia (M2)" J Pediatr Hematol Oncol. 2006; 28: 682-3.
7. Dulac Y, Pienkowski C, Abadir S, Tauber M, Acar P. Cardiovascular abnormalities in Turner's syndrome: what prevention?. Arch Cardiovasc Dis. 2008; 101: 485-90.
8. Schoemaker MJ, Swerdlow AJ, Higgins CD, Wright AF, Jacobs PA; UKClinicalCytogeneticsGroup.Cancer incidence in women with Turner syndrome in Great Britain: a national cohort study. Lancet Oncol. 2008; 9: 239-46.
9. Ji J, Zöller B, Sundquist J, Sundquist K. Risk of solid tumors and hematological malignancy in persons with Turner and Klinefelter syndromes: Int J Cancer. 2016; 139: 754-8.
10. Xavier AC, Taub JW, "Acute Leukemia In Children With Down Syndrome" Haematologica. 2010; 95: 1043-5.