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Case Report

Femoral Head Avascular Necrosis in Heterozygous Sickle Haemoglobin, the Role of Parenteral Drug Abuse: A Case Report

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Sickle cell trait is a benign haemoglobin disorder which rarely results in disease or complications. A few cases of osteonecrosis have been reported in the literature in parts of the world with advanced health care system. There are various predispositions to developing avascular necrosis in general, while the sickle beta globin gene inheritance is the most efficient factor. Injection drug abuse has not been strongly link to the development of bone necrosis. Here we report a case of bone necrosis in an elderly man and raise awareness on osteonecrosis being a possible complication of injection drug misuse in heterozygous sickle haemoglobin disorder. A 68 year old retired health dispensary attendant presented at the clinic with an 18 months history of progressive right hip pain associated with difficulty in walking. He had engaged in self prescriptions, procurements and repeated administrations of pentazocine injection into his anterior thighs. He had an abnormal gait with bilateral discharging ulcers on both thighs anteriorly. Haemoglobin protein electrophoresis revealed AS status, while the pelvic X-ray showed necrosis of the right femoral head. Consequently, osteonecrosis may be one of the ultimate complications of parenteral drug abuse in heterozygous sickle haemoglobinopathy.

Keywords: Heterozygous sickle cell haemoglobinopathy, parenteral drug abuse, avascular necrosis

Sickle cell trait (SCT) is the heterozygous state of sickle cell disorders, the most benign of the β^S globin gene disorders affecting about 8% of African Americans and higher percentage of the population in Africa (1). A 1995 study among American military recruits documented a 0.046% and 8.0% SCT among non-blacks and blacks respectively (2). The known causes of avascular necrosis (AVN) are either traumatic or non-traumatic. The non-traumatic associated aetiologies include drugs, haematological disorders, metabolic derangement, autoimmunity and pancreatitis (3, 4). AVN is a recognized complication of the sickle cell disease. Iwegbu and Fleming reported in 1985, a 3% prevalence of AVN of the femoral head among 6 to 15 years old sickle cell disease children (5). Akinyoola et al. reported that AVN of the femoral head occurred in haemoglobin SS and SC patients

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aged 21 to 30 years, mostly presenting late with advanced disease (Ficat stage IV) (6).

Clinical illnesses associated with SCT are rare, hence inaccurately documented. Reported complications include cerebral thrombosis during anaesthesia, sign of haemolysis with severe cyanotic congenital heart disease, renal lesions with haematuria, thromboembolic episodes affecting the lungs, sudden death from rhabdomyolysis and development of splenic infarct in unpressurized air craft (6).

The inheritance of the β^S globin gene is known to offer some protection against red cell penetration by plasmodium parasite, the agent that causes malaria. The over representation of AS haemoglobin phenotype among athletic champions in Ivory Coast was observed, providing another evidence of the relationship between the inheritance of the β^S globin gene and resistance to stress (7). The apparent advantage of the S haemoglobin among athletes in Ivory Coast did not however collaborate with documented enhanced tendency for sudden death of individuals with SC trait in physical training (8).

Joint infarction in haemoglobin AS phenotype is a rare complication as only few reports are in the literature. There is no report of osteonecrosis in persons with SCT known to us in our setting. Here we report a case of femoral head AVN linked to parenteral injection drug abuse, in an elderly man with AS haemoglobin phenotype in Jos, Nigeria. Ethical clearance for this case report was obtained from the Ethical Committee of the Jos University Teaching Hospital Jos while an oral consent was obtained from the patient and his care giver (son).

Case report

P D was a 68 year old man who presented in the haematology clinic of the Jos University Teaching Hospital, Jos, Nigeria, in 2012, with complaint of progressive right hip pain of 18 months duration. The pain was associated with abnormal gait; worsened with ambulation necessitating the use of a walking crunch. The patient had engaged in self-prescription and administration of pentazocine into both anterior thigh muscles over the past three years before presentation, to obtain relieve from unresolved social problems and body pains. The repeated injections were not aseptically administered, hence swelling and induration began to develop for which more injections were required to relief the pains. The indurations eventually ulcerated with purulent discharges.

The patient was detained in a psychiatric and rehabilitation home for drug and alcohol abuse from where he was brought to us. There was no associated history of conjunctiva yellowness, bone pains and swelling, abdominal distension or blood transfusion. He was not a known diabetic, hypertensive or on any long-term prescribed medications. He worked as a missionary dispensary attendant for thirty-four years and was retired since five years.

None of the following signs were observed: distress, paleness, icterus, intra-abdominal organs enlargement, peripheral lymphadenopathy, deformed digits, skin ulcers or scars except on bilateral anterior thigh. His respiratory and cardiovascular systems evaluation was essentially normal. The lower limbs had tender anterior thigh swellings that were discharging pus from ulcerated surfaces. The right lower limb was 4 cm shorter than the left with tender ipsilateral hip movements.

His full blood count results were; packed cell volume (PCV) 0.39 with normocytic normochromic red blood cells. Total white blood cells count was 6.6 x 10^9/L with a differential count of neutrophils 48%, lymphocytes 42%, monocytes 6%, and eosinophils 4%. Cellulose acetate haemoglobin protein electrophoresis by Shandon electrophoretic tank confirmed AS status. Liver and renal function tests were all within normal limits. Serum lipids and uric acid were normal. Abdominal ultrasound was normal, and pelvic X-ray demonstrated osteonecrosis of the right femoral head, Ficat stage V (Figure 1).

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Figure 1. Pelvic X-ray showing osteonecrosis of the right femoral head, Ficat stage V. The patient was counselled on the AVN, its effects and subsequent management. He was placed on oral non-steriodal anti-inflammatory and analgesic drugs to relief pain. Requests for consultation were written to the orthopaedic surgeon, physiotherapist, and health social worker for multidisciplinary care. The multidisciplinary care could not continue due to financial constraint as the patient was lost to follow-up.

Discussion

Our patient is a retired community health worker, suggesting a long term exposure to, and familiarity with pentazocine he eventually abused. His exposure to drugs while working, afforded him the advantage of informed repeated self-requests, access to and unguided utilization of this drug with addiction potential. The general poor control on drugs in our setting might have allowed for easy access to medicaments, not to be sold un-prescribed. Therefore, there is need for control agencies of government to strengthen the check mechanisms that would prevent self-prescription, request and purchase of control drugs, in particular those with addictive potential.

The age of our patient may be a predisposition to pathologic fracture as a result of osteopathies rather than isolated femoral head osteonecrosis (7). History of alcohol intake in this patient for about the same period with self-administration of pentazocine, suggests a complementing motivational predisposition (2). Other non-traumatic factors associated with AVN were not found in our patient (2).

The low socio-economic state of our patientas suggested by his previous employment as a clinic attendant, the least paid cadre of health care workers in our setting, and inability to afford orthopaedic care was likely worsen by diversion of the inadequate income to sustained purchases of pentazocine from the counter. It is therefore proactive to educate citizenry, particularly health care workers on the dangers of drug abuse and dependency, as it can be linked to the development of preventable ailments which treatment might be expensive.

The repeated administration of pentazocine into his anterior thigh muscles must have initiated local inflammation and infection, as asepsis might not have been observed. The cellulitis he developed provided a focus from which proximal drainage via the lymphatics and haematogenous route led to vasculitis, stasis and vascular occlusion. Stasis at the end vessel supplying the femoral head might have created an area of localised hypoxia, acidosis and sickling of the S haemoglobin in in our SCT patient, more so if stasis was repeated, prolonged or both. This is supported by Beutler who opined that acidosis shifts oxygen dissociation curve by displacing the equilibrium between the high affinity oxy and low affinity deoxy conformations towards the latter haemoglobin, enhancing aggregation of sickle haemoglobin, distortion and sickling of red blood cells and eventual occlusion of microvasculatures (7). Our opinion is further supported by Mani and Duffy who reported unusual but demonstrated sickle cell myonecrosis in patients with sickle cell diseases (10). The report of myonecrosis involving the facia and secondary joint involvement in a sickle cell anaemia patient following severe left thigh pain (11) and the documentation of recurrent episodes of symmetrical proximal muscle pain, with histologic features of myonecrosis and myofibrosis in four sickle cell anaemia patients (12) suggest the risk of ascending infection to the proximal joint as might have occurred in our patient. The induration, suppuration and scar seen on the anterior thigh of our patient suggest that both repeated aseptic improper parenteral drug administration and chronic sequel of myositis might have drained to the head of the femur

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with subsequent inflammation and necrosis. Chronic myositis in haemoglobin AS phenotype individuals could lead to AVN of the bone. This calls for routine haemoglobin electrophoresis on patients with musculoskeletal inflammation and prompt intervention in those who are SCT. It further calls for haemoglobin S screening of inmates in substance abuse rehabilitation homes with the view to identify those at risk of AVN for early counselling and prevention.

We conclude that parenteral drug abuse could lead to debilitating musculo-skeletal complication in individuals minimally prone to red cell sickling. There is need to expand the scope of counselling inmates in substance abuse rehabilitation homes to include the likely genetic predisposition.

Conflict of interest

The authors declared no conflict of interest.

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