

Advanced Bronchogenic Carcinoma with Secondary Liver Metastasis and Sepsis as an Initial Hospital Presentation; The Shortcomings of Preventive Care Medicine in Nigeria

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ABSTRACT

Chronic diseases are the most prevalent worldwide. Evidence-based medicine points to primary care as the most effective tool to minimize the burden through primary prevention and early detection of diseases. In keeping with this, the primary care arm of medicine can be regarded as the gatekeeper of public health. The rising incidence of chronic diseases indicates that the primary care system may fail to live up to its responsibility. We present a case of an elderly male who came to the hospital with advanced bronchogenic carcinoma, secondary liver metastasis, and sepsis. He presented for the first time in over a year since he started experiencing symptoms. He had no contact with his primary care physicians, nor was he vaccinated against the influenza virus or the coronavirus.

Learning Objectives

- To review the subject of Bronchogenic Carcinoma (BC).
- To address primary prevention as a huge player in reducing the burden of BC.

Keywords: chronic diseases; bronchogenic carcinoma; liver metastasis; sepsis

HISTORY OF PRESENTATION

A 75-year-old male farmer presented to the emergency unit with complaints of difficulty breathing five hours before the presentation, fever of two weeks, and recurrent cough over the last year. He was too dyspnoeic to speak, so his daughter was the informant. The cough was of insidious onset, non-paroxysmal, productive of brownish sputum, and worse at night. He had a history of progressive weight loss evidenced by loose-fitting of previously fitted clothing and had a 50-pack-year smoking history. He had no history of contact with anyone with chronic cough, no history of hemoptysis or drenching night sweats, no history of pulmonary tuberculosis (PTB), asthma, or chronic obstructive pulmonary disease (COPD), and had not received COVID-19 vaccination.

The fever was high grade, intermittent, associated with chills, and transiently relieved by antipyretics. There is no history of dysuria, frequency, intermittency, terminal dribbling, or poor urine stream.

Difficulty in breathing was of insidious onset and progressively worsened till presentation. There was no history of orthopnea, paroxysmal nocturnal dyspnoea (PND), or effort intolerance. He was not a known hypertensive or diabetic. However, he consumed alcohol significantly, although the specific unit could not be ascertained. With the onset of symptoms, he was initially taken to a peripheral facility, where he was transfused with one unit of blood on account of a packed cell volume (PCV) of 23%.

On general physical examination, He appeared pale and lethargic, in obvious respiratory distress; Respiratory rate (RR) of 40 cycles per minute (CPM), and was febrile to touch (38.6 degrees Celsius) with grade three digital clubbing. The cardiovascular exam revealed pulse rate (PR): 96 beats per minute (bpm), regular normal volume, blood pressure (BP): 120/70 mmHg, Jugular venous pressure (JVP): not elevated, Apex; sixth left intercostal

space lateral to the midclavicular line but not heaving, Heart sounds (HS) 1&11 heard only. His abdomen was full and moved with respiration. The liver was 6cm below costal margin, firm, and non-tender. There were no signs of ascites or tenderness, and the digital rectal exam was deferred because of his distressed state. His power was 3/5 in all limbs. An initial assessment of sepsis with a focus in the pulmonary and urogenital system (UGS) with a background of chronic obstructive pulmonary disease (COPD) was made.

INVESTIGATIONS

Full blood count (FBC); PCV-25% (40%-50%), Total white blood cell count-19,300 (4500-11000), Neutrophils-81.4% (54-62%), Lymphocytes-11.9% (20-40%), Monocytes-6.4% (2-8%), Eosinophils -0.7% (0-6%), Basophils-0.1% (0.1-1%), Platelets-219,000/mm³ (15000-450000/mm³),

Erythrocyte Sedimentary rate (ESR) -80mm/hr. (1-13mm/hr.). Liver function test (LFT); Aspartate Amino Transferase-51U/L (8-33U/L); Alanine Transferase-17U/L (7-55U/L); Alkaline Phosphate-923IU/L(44-147IU/L); Conjugated Bilirubin- 0.3mg/dL (less than 0.3mg/dL); unconjugated bilirubin-0.1mg/dL (less than 0.3mg/dL). Urinalysis revealed one plus of nitrite with other metrics within normal limits. The retroviral screening (RVS) was negative, COVID-19 PCR: Negative, Sputum gene Xpert: negative.

The abdominopelvic ultrasound scan revealed an enlarged liver measuring 16x10 cm in span and harbored diffusely spread varying-sized rounded hypoechoic masses with irregular outlines. The spleen, gallbladder, pancreas, and kidneys appeared normal. This gave an impression of liver metastasis and the quest for a primary site.



FIGURE 1: The abdominopelvic ultrasound scan



FIGURE 2: Chest X-ray revealed a lobulated hilar mass and left pleural effusion

Advanced bronchogenic carcinoma with secondary liver metastasis and sepsis focus pulmonary and UGS were made following these clinical findings and radiographic results.

MANAGEMENT

He was treated with intravenous (I.V) 5% dextrose saline, intramuscular (I.M) acetaminophen, I.V levofloxacin, oral doxycycline, Oxygen (O₂) via nasal prongs, and bladder catheterization for fluid monitoring. He was transfused with two units of whole blood (packed cell was not available). Chest CT, sputum m/c/s, and sputum gene Xpert were ordered but were not carried out before the patient's demise due to financial constraints.

On day two of admission, the patient's clinical condition deteriorated further with a Glasgow Coma Scale (GCS) of 11/15, respiratory rate (RR): 48 CPM, with reduced breath sound in the entire left hemithorax with coarse crepitations on the right mid and lower lung zone. PR was 60 bpm, regular, small volume, BP: 90/60 mmHg. He passed away two hours later.

DISCUSSION

Bronchogenic carcinoma refers to malignant tumors originating in the lung parenchyma or within the bronchi. It is among the leading causes of cancer-related deaths in the United States [1]. The incidence of bronchogenic carcinoma is connected to cigarette smoking patterns, as the smoking rate increased and peaked – first in men, followed by women. The incidence and mortality of bronchogenic carcinoma rose decades ago before declining following the intervention of tobacco control initiatives [2,3].

Presently, bronchogenic carcinoma is on the rise worldwide, as it is the second most common cancer diagnosed by gender, behind breast cancer in women and prostate cancer in men [4]. The rate of bronchogenic carcinoma varies worldwide, showing the geographical differences in tobacco use and air quality. Its incidence and mortality rates have been rising in developing countries compared to industrialized nations [5]. Developing countries like Nigeria have a lower incidence of cancer but a relatively higher mortality burden when compared to countries like the US. This trend is due to the disparities in access to healthcare evolving into delayed diagnosis and treatment, limited diagnostic facilities, environmental contamination, and sociocultural barriers [5].

Risk factors for bronchogenic carcinoma include cigarette smoking [6], secondhand smoking [7], use of unprocessed biomass fuels (wood, coal, dung, crop residues) [8], occupational exposures (exposure to asbestos, coal mining, silica, beryllium) [5], ambient air pollution and other environmental exposures (nitrogen oxides, nitrogen dioxide, sulfur dioxide, residential radon exposure, and arsenic) [9]

The provision of integrated, accessible health care services by clinicians and other health experts who address most health care needs, culminating in a sustained partnership with patients and practicing in the context of family and community [10]. One of the critical values of primary care is the provision of opportunities for disease prevention and health promotion and early detection of problems at all ages. The proactive stance of primary care health workers benefits patients in preventing illness and early detection of disease. This is carried out through health promotion, screening programs, first-line treatment options, prompt referral services, and continuity of care [10].

Regarding the demise of this 75-year-old male farmer who presented with features of advanced bronchogenic carcinoma with secondary liver metastasis and sepsis on his initial visit to the hospital, this shows the falling standard of preventive care in a typical developing country, as this patient did not benefit from the required regular personal interaction from a primary caregiver, his prevailing risk factor was not discussed, smoking cessation interventions were not offered, and periodic screening for bronchogenic carcinoma was not done. This is in contrast with the measures taken in developed countries, especially in the US, where the United States Preventive Services Task Force (USPSTF) recommends screening for lung cancer with low-dose computed tomography (CT) scan every for adults aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or have quit smoking within the past 15 years, and discontinuation of screening once a person has not smoked for 15 years or has a health problem that limits life expectancy or the ability to have a lung surgery [11].

This patient could also have benefited from other preventive measures based on his risk factors. These included screening for abdominal aortic aneurysm, colorectal cancer, prostate cancer, type 2 diabetes or abnormal glucose, cholesterol/lipids, Hepatitis C, HIV, alcohol misuse, depression, and domestic violence (elderly abuse) [12].

Other modalities for bronchogenic carcinoma screening include chest X-rays and sputum cytology. However, reports have shown that these two screening tools do not benefit the early detection of bronchogenic carcinoma [5]. Primary care in the western world has significantly reduced the burden of various diseases by fostering early detection of diseases, which often leads to better and planned decision-making between the primary care clinician and patients and sometimes their families, likely lowering the cost of care and providing swift intervention when required [10]. Primary care is also known to increase access to health services for the relatively underserved population.

According to Doorslaer et al., most industrialized countries, except for the United States, have achieved universal and equitable primary care services, some of which are provided directly or through the assurance of financial coverage for visits [13]. Over the years, the US has developed social programs (Medicare, Medicaid, and related programs like the State Children's Health Insurance Program) that have helped lessen the financial burden and ease access to primary care [14].

Regarding the impact of primary care in reducing the burden of bronchogenic carcinoma in developed countries, the UK's National Cancer Diagnosis Audit reported that the median primary care interval (time from the first presentation to referral) for lung cancer was 14 days [15]. Evidence suggests that these prompt referral services by the primary care practitioner and greater access to investigations are associated with improved survival [15]. Although Vedsted et al. reported that systems in which primary care practitioners have a prominent role in rationing access to secondary care had been associated with poorer survival for ten of the most common cancers, including lung cancer [16]. However, most lung cancers are still diagnosed during the emergency presentation as the most common symptoms (cough, breathlessness, and chest pain) associated with bronchogenic carcinoma tend to be both common in benign presentations in the community and more so in smokers [15].

Although primary care has vastly improved the overall health status of the population, some of its shortcomings have increased the burden of some non-communicable diseases, including bronchogenic carcinoma, especially in rural settings, where some of the primary care settings have limited staff, limited access to technology, minor specialization, little electronically available information, and fewer training opportunities in contrast to their counterparts in urban environments [17].

CONCLUSION/RECOMMENDATION

Recognizing that the primary care arm of medicine cannot be overemphasized in the battle to reduce the burden of chronic preventable diseases and in some diseases e.g. bronchogenic carcinoma, whose outcomes are improved with early attention in primary care clinics. In lieu of this, we recommend that the primary care arm be given full attention through operational funding, staffing, and public sensitization. Furthermore, improved access to the National Insurance Scheme of Nigeria to ease the burden of care costs on individuals and encourage prompt clinic presentation and follow will mitigate the current burden of chronic illnesses in our society.

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