A CASE REPORT OF SECONDARY ACUTE MYELOGENOUS LEUKEMIA

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Abstract:
ABSTRACT Secondary Acute Myelogenous Leukemia (AML) is a clinical entity classified by WHO as a separate group of patients whom developed AML after a Myelodysplastic syndrome (MDS) or after treatment of another malignancy with cytotoxic chemotherapy or radiation. We discussed a case of secondary AML, arises in a carcinoma larynx patient after treatment with both radiotherapy and chemotherapy.

Keyword: KEYWORDS Acute Myelogenous leukemia, Secondary acute myelogenous leukemia, chemotherapy, radiotherapy.

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INTRODUCTION:
Acute Myelogenous leukemia (AML) is a clonal malignant disorder due to the result of a sequence of somatic mutations in a multipotential primitive hematopoietic cell or in some cases a more differentiated progenitor cell. Exposure to radiation, chronic exposure to high doses of Benzene and chronic heavy inhalation of tobacco smoke are the causes of increase in the incidence of AML. A small but increasing proportion of cases develop after a patient with Lymphoma or a non hematologic cancer is exposed to intensive chemotherapy especially with alkylating agents or topoisomerase inhibitors.

CASE REPORT:
61 year old male patient Mariyappan, I.P.No: 1350642, known case of Carcinoma Larynx admitted on 31.10.'11 with H/O Easy fatigability and Intermittent fever – past 1 month duration H/O Dark coloured stools – past 20 days H/O Cough with expectoration + No H/O Bony pain and tenderness No H/O chest pain / palpitation No H/O Abdominal pain or swelling Past history: Patient was a known case of CARCINOMA LARYNX for the past 4 years on treatment at ENT and Radiation oncology. · Patient presented with Stridor at the time of diagnosis on Feb ‘07 · Tracheostomy was done on the next day, he is on tracheostomy till date · Patient was surgically inoperable at that time ·
22 cycles of Radiotherapy was given on July and August '07 · Patient was followed up, subsequent Chemotherapy given on Feb '09 with Inj.Cisplatin and 5-Flourouracil · Not a smoker or alcoholic · Known Hypertensive on T.Amlodipine 5mg OD, No other medical illness On examination: · Pt was conscious, comfortable at rest, anemic, no jaundice or lymphadenopathy, no petechiae or ecchymosis, no gum hypertrophy, no sternal tenderness, tracheostomy in situ · Vitals stable, no visible JVP, febrile · System examn – clinically normal Investigations: · Hb - 7.4gm% · Total WBC –16,000/cmm · Diff. Count – ATYPICAL CELLS SEEN · Platelets – 0.6 lakhs/cmm · RBC – 2.1 millions /cmm · PCV – 22% · ESR – 40 mm in 1 hr · Blood sugar, renal parameters, liver function tests, urine analysis, sr.electrolytes, ECG and Chest X-Ray – within normal limits · Peripheral smear: (3307/11) -Normocytic Normochromic RBCs with Polychromasia of Nucleated RBCs -WBCs composed of MYELOBLAST > 20% ·Platelet – very much reduced IMPRESSION: ACUTE MYELOID LEUKEMIA Bone Marrow Aspiration: Smear shows MYELOBLAST > 20% IMPRESSION: ACUTE MYELOID LEUKEMIA


FINAL DIAGNOSIS: CARCINOMA LARYNX/ SECONDARY AML/ CHEMORADIATION INDUCED.

Pt was treated with Packed RBCs, Platelet concentrate, Fresh frozen plasma and Antibiotics. Referred to higher centre for further cytogenetic analysis and management.

**DISCUSSION:**

Secondary AML arise after MDS or after treatment of another malignancy with cytotoxic chemotherapy or radiation. This type of AML accounts for approximately 15% of all AML, although this percentage is increasing. This patient, known Ca Larynx patient received radiotherapy and chemotherapy both 4 years and 2 years back respectively now presented with AML. Chemotherapy; WHO classified this type of patients of AML in a separate group in 2008 revised classification as class 3, “AML and MDS, Therapy - related : This category includes patients who have had prior chemotherapy and/or radiation subsequently develop AML or MDS. a) Radiation/Alkylating therapy related b) Topoisomerase II inhibitors related” 

Alkylating agents and cisplatin cause AML often preceded by myelodysplasia. The mean latency period after onset of treatment is approximately 6 years. Deletions of all or part of chromosome 5 or 7 are the most common cytogenetic changes. The risk is related to cumulative alkylating agent dose. Germ-line aberrancies of NF1 and p53 increase the risk of AML. Cisplatin used for treatment of ovarian cancer also increases the risk of leukemia. The Leukemogenic risk of treatment regimens depends on the agents used. Our patient exposed to cisplatin around 2 and half years back. Further development of agents with lower risk of inducing AML is important. Radiotherapy; This patient was treated with 22 cycles of radiotherapy 4 years back. Patient developed secondary AML with a latency period of 4yrs. Reference range of latency period is 4-6 yrs.
The first cancers that were related to radiation exposure were skin cancers detected only a few years after the discovery of x-rays.\textsuperscript{9,10,11} Radiation Treatment associated risks are well documented and in many instances quantified with respect to dose-response relationships.\textsuperscript{9,12,13} Studies of radiation induced AML suggest a mechanism involving Chromosome deletions, particularly involving chromosome 5 and 7.\textsuperscript{9,14} Treatment of Secondary Leukemia; Secondary AML responds more poorly to chemotherapy and Stem Cell Transplant than does de novo AML.\textsuperscript{1} Secondary leukemia generally is treated similarly to de novo leukemia. However, given the lower response rates and remission durations of secondary leukemia, patients can be treated in clinical trials examining new therapies (ex: Myeloid growth factors)\textsuperscript{5} or treated initially with chemotherapy regimens used for refractory disease.\textsuperscript{1,15} Some patients may benefit from early hematopoietic stem cell transplantation (SCT).\textsuperscript{1,16} Autologous transplant can be successful if stem cells are harvested prior to 2\textsuperscript{nd} AML.\textsuperscript{1,17} In those who have low blood blast counts, allogenic SCT as initial therapy may be superior to chemotherapy followed by transplantation.\textsuperscript{1,18} Although patients may have response rate to standard induction chemotherapy of around 50%, most soon relapse, and long-term survival is approximately 10\%.\textsuperscript{1,19} Secondary AML more often has unfavourable cytogenetic features compared to de novo AML.\textsuperscript{1,20}

CONCLUSION:
Since the incidence of malignancies is increasing, the number of patients undergoing chemotherapy and radiotherapy are also high. So we have to keep monitoring the patients for the development of secondary haematological and solid malignancies since they have very poor prognosis.

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**ABBREVIATIONS USED:**

AML - Acute Myelogenous Leukemia
AMO - Secondary Acute Myelogenous Leukemia
DC - Differential Count
ESR - Erythrocyte Sedimentation Rate
Hb - Hemoglobin
HSCT - Hematopoietic Stem Cell Transplantation
MDS - Myelodysplastic Syndrome
PCV - Packed Cell Volume
RBC - Red Blood Cells
SCT - Stem Cell Transplantation
TC - Total Count
WBC - White Blood Cells

THANK YOU