

# PHYSICIAN CONNECT

**Dear Doctor,**

**Greetings from Micro Labs. We are happy to bring you “Physician Connect” which contains latest and interesting news.**

**This issue contains:**

- 1. Incidence, degree and clinical importance of iodine contrast media-induced thyroid dysfunction and its related risk factors**
- 2. Impact of Anemia on Long-Term Mortality in Hospitalized Patients with COPD Exacerbation**
- 3. Correlation between COPD and mortality among individuals with arthritis**
- 4. Case report on the management of spontaneous thyroid haemorrhage**

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**Looking forward to your valuable feedback.**

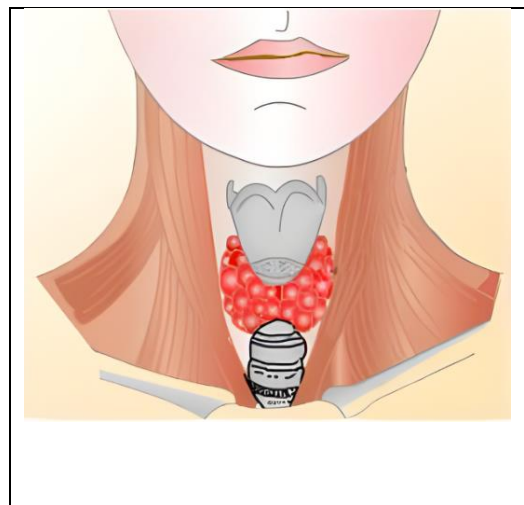
**Best Regards,**

**Medical Team, Micro Labs Limited.**

## 1. Incidence, degree and clinical importance of iodine contrast media-induced thyroid dysfunction and its related risk factors

### Introduction:

Radiologists depend significantly on contrast media for their diagnostic and interventional procedures. Iodinated contrast medium (ICM) is most commonly utilized in CT scans. The use of ICM is continuously increasing as CT scanner availability increases and more medical treatment choices require a CT scan.<sup>1</sup> Injecting ICM may cause thyroid dysfunction due to free iodide in the solution. The reported frequency of ICM-induced thyroid dysfunction ranges from 0.05% to 22%. Previous research on contrast-induced thyroid dysfunction have been observational and retrospective, making it difficult to evaluate the incidence.<sup>2</sup> This study aimed to assess the prevalence, extent, and clinical significance of ICM-induced thyroid dysfunction and associated risk factors, such as thyroid peroxidase antibodies (TPOabs) and thyroid nodules.



### Methods:

In this prospective study, thyroid hormone levels were analysed before and 4–12 weeks after contrast-enhanced coronary CT angiography (CCTA). At the time of pre- and post-CCTA blood samplings, 368 of those patients answered thyroid-related patient-reported outcome questionnaires (ThyPRO). Thyroid peroxidase antibodies (TPOab) were tested, and an ultrasound of the thyroid gland was conducted to identify any nodules. The frequency and severity of early thyroid dysfunction 4–12 weeks following ICM exposure served as the study's primary outcome measure. Tests of correlations between ICM-induced thyroid dysfunction and associated risk variables (thyroid nodules, TPOab, and demographic information) as well as whether ICM-induced thyroid dysfunction had an impact on participants' quality of life were secondary outcomes.

## Results:

In a study of 422 participants (mean age:  $57.8 \pm 4.2$  years, 231 women), 388 (92%) had their post-CCTA blood samples analyzed 4-12 weeks later. ICM had a small impact on thyroid hormone levels, but no incidences of hypothyroidism or hyperthyroidism were reported. 3.5% of the group with normal hormone levels pre-CCTA had subclinical hypo- or hyperthyroidism or isolated low/high levels of free thyroxine (fT4) but did not have any increased thyroid-related symptoms compared to the others (Table 1). Subclinical hypothyroidism was associated with elevated TPOab levels and birthplace. There was no correlation between thyroid nodules and ICM-induced thyroid dysfunction.

|              | Median difference | Range         |
|--------------|-------------------|---------------|
| TSH (mIU/L)  | 1.15              | -0.80 to 3.10 |
| fT4 (pmol/L) | -0.5              | -4.0 to 8.0   |
| fT3 (pmol/L) | -0.25             | -1.10 to 1.30 |

Table 1: Variations in thyroid hormone levels in 14/399 (3.5%) people who had normal baseline thyroid hormone levels before developing thyroid dysfunction following exposure to ICM.

## Discussion:

The study demonstrated that people aged 50-65 years exposed to ICM at CCTA observed a slight but statistically significant increase in TSH levels 4-12 weeks later. There were eight cases of subclinical hypothyroidism and one of preclinical hyperthyroidism, but no overt hypo- or hyperthyroidism was observed.<sup>2</sup> According to the European Thyroid Association (ETA) guidelines (2021), new onset thyroid dysfunction after ICM is typically minor and self-limiting, requiring no particular treatment.<sup>3</sup>

## Conclusion:

This study showed that in iodine-sufficient nations, ICM-related thyroid dysfunction is typically low, self-limiting, and asymptomatic in those aged 50-65.

ICM-associated thyroid dysfunction is often low, self-limiting, and asymptomatic in individuals aged 50-65 years.

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## 2. Impact of Anemia on Long-Term Mortality in Hospitalized Patients with COPD Exacerbation

### Introduction:

Chronic obstructive pulmonary disease (COPD) is a chronic lung disease where its pathophysiologic causes are complicated, involving both innate and adaptive immune cells as well as elevated levels of inflammatory cytokines. Cigarette smoking and aging both contribute to this abnormal inflammatory pathophysiology and are two of the most powerful risk factors for the development and progression of COPD.<sup>1</sup> Patients with COPD have a higher risk of mortality than the general population. Several multifunctional indices have been developed to predict mortality in COPD patients. However, these models only show limited discriminative potential. Anemia is a risk factor for mortality in the general population, regardless of age, gender, or cardiovascular disease history. It is especially common in COPD patients, with prevalence rates ranging from 5% to 38%. Despite its significance, this characteristic has not been included in COPD mortality prediction models.<sup>2</sup> This study evaluated the effect of anemia on the mortality risk of COPD patients hospitalized for exacerbation. Additionally, it aimed to determine the cause for mortality for these individuals in order to determine whether it varies for COPD patients with and without anemia.

### Methods:

An observational retrospective analysis was conducted using data that was prospectively gathered from consecutive patients who were admitted due to an exacerbation of their COPD. Clinical parameters, including anemia, survival time, and reason of death, were noted. Patients were divided into two categories: anemic (women with hemoglobin levels < 12 g/dL, men with hemoglobin levels < 13 g/dL) and non-anemic. Survival analysis was performed with Kaplan-Meier curves and Cox proportional hazard regression to evaluate the association between anemia and all-cause mortality.

### Results:

The study included 125 patients, 20% of whom were women. Among them, 31 (25%) were diagnosed as anemic. The study found that 59 patients (47%) died, including 27 out of 31 anemic patients (87%) and 32 out of 94 non-anemic patients (34%) ( $p < 0.001$ ). The mortality probability curves according to the presence of anemia are shown in Figure 1. Anemia was a strong predictor of mortality one year after admission (adjusted hazard ratio HR; 5.20 [1.86-14.55]), three years later (HR 4.30 [2.03-9.10]), and at the study completion (with a follow-up period ranging from 38 to 56 months) (HR 3.80 [1.96-7.38]). Patients with anemia had a mortality rate of 27 (87%) compared to 32 (34%) in the control group ( $p < 0.001$ ). The reasons for mortality in patients with and without anemia were similar.

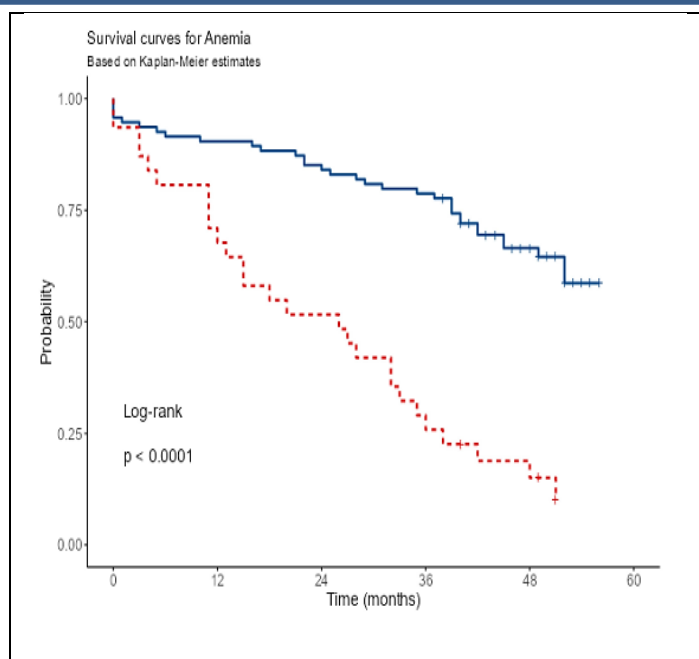


Figure 1: Figure 1: Anemic (dashed red line) and non-anemic (solid blue line) survival curves.

### Discussion:

This study showed that anemia in individuals admitted to the hospital for COPD exacerbation is a major predictor of mortality.<sup>2</sup> A previous study of COPD patients hospitalized with respiratory failure showed that those who were anemic had worse survival rates after one or two years.<sup>3</sup> In the present study, patients hospitalized for COPD exacerbation had a greater prevalence of anemia, reaching 25%.<sup>2</sup> In another study of hospitalized patients, the frequency was significantly higher, reaching 38%.<sup>3</sup>

### Conclusion:

Exacerbation in COPD patients is associated with a higher risk of mortality. Detecting anemia during a COPD exacerbation is a strong predictor for subsequent mortality.

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Anemia detected during COPD exacerbation is a strong predictor for potential mortality.

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### Reference:

1. Miller PG et al. Association of clonal hematopoiesis with chronic obstructive pulmonary disease. *Blood*. 2022 Jan 20;139(3):357-68.

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### 3. Correlation between COPD and mortality among individuals with arthritis

#### Introduction:

Arthritis, a chronic disease, is a major cause of disability globally. As the population ages and patient survival rates improve, the incidence and prevalence of this condition has significantly grown.<sup>1</sup>

Chronic obstructive pulmonary disease (COPD) is a slow-developing, incurable lung illness that causes airflow limitation and can lead to complications like pulmonary heart disease and respiratory failure. COPD is caused by a complex interaction between genes and the environment. Cigarette smoking is the most significant environmental risk factor for COPD. Besides these, COPD is also influenced by various risk factors such as age, gender, lung growth and development, exposure to particles, socioeconomic level, asthma, airway hyper-reactivity, chronic bronchitis, and infections.<sup>2</sup>

Recent studies indicate a complex relationship between COPD and arthritis, which may impact patient outcomes through similar inflammatory pathways, lifestyle factors, and genetic predisposition.<sup>1</sup> This study was conducted to assess the link between COPD and mortality in arthritis patients.

#### Methods:

This prospective cohort study analyzed 11,298 people from the 1999-2018 National Health and Nutrition Examination Survey (NHANES) including 1795 self-reported COPD participants and 9503 non-COPD participants who reported having arthritis. The diagnoses of arthritis and COPD were based on responses to the disease and health survey questionnaire. The primary outcome was all-cause mortality, which is defined as death occurring from any cause. The study employed Cox proportional hazard models to examine the association between COPD and mortality in arthritis patients. Kaplan-Meier curves were used to compare survival probabilities between groups. Subgroup and sensitivity analyses were carried out to determine the accuracy of the results.

#### Results:

In this study, a total of 11,298 patients with self-reported arthritis were included. The average age of participants was  $59.2 \pm 14.1$  years, with a gender distribution of 39.93% male and 60.07% female. During an 8.8-year follow-up, 3061 all-cause mortality were recorded, with 1024 due

to cardiovascular disease (CVD). Weighted multivariable analysis revealed a substantial association between COPD and all-cause and CVD mortality among arthritis participants. In arthritic patients with COPD, the hazard ratio for all-cause death was 1.41 (95% CI: 1.25-1.60,  $p < 0.001$ ), whereas the hazard ratio for CVD mortality was 1.29 (95% CI: 1.08-1.53,  $p < 0.001$ ). According to Kaplan-Meier survival curves, individuals with COPD had greater rates of all-cause and CVD mortality than those without (log-rank test,  $p < 0.001$ ) (Figure 1). COPD increased the risk of chronic lower respiratory disease (CLRD) mortality (HR 5.46, 95% CI: 3.48-8.56,  $p < 0.001$ ) and non-CLRD mortality (HR 1.24, 95% CI: 1.07-1.44,  $p = 0.004$ ).

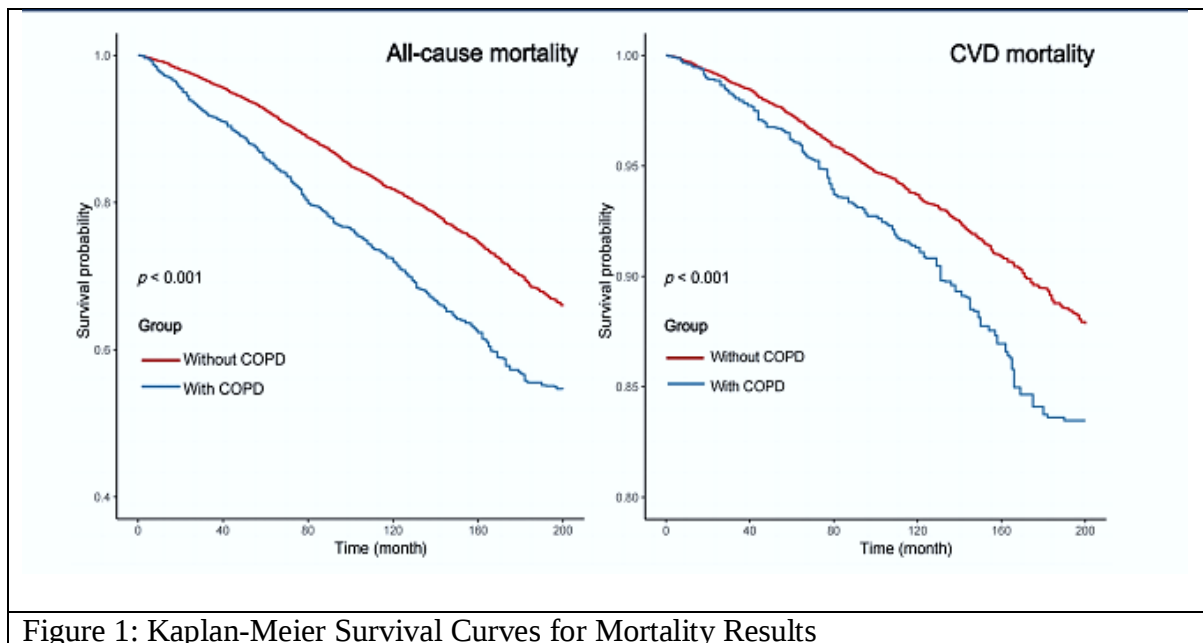


Figure 1: Kaplan-Meier Survival Curves for Mortality Results

## Discussion:

This study showed a significant association between COPD and all-cause and CVD mortality among people with arthritis.<sup>1</sup> A previous study showed that arthritis was strongly correlated with the risk of developing lung diseases.<sup>3</sup> Another study with 46,030 RA patients found that RA was associated with a higher risk of developing COPD, which rises with a higher seropositive rate.<sup>4</sup>

## Conclusion:

Arthritis patients with COPD are at a higher risk of all-cause and CVD mortality than those without COPD. These findings suggest that physicians should treat these patients more comprehensively, giving special attention to comorbidities that could worsen clinical outcomes.

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Arthritis patients with COPD have a greater risk of all-cause and CVD mortality than those without COPD.

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## Reference:

1. Zhang Y et al. Association Between Chronic Obstructive Pulmonary Disease and Mortality in Participants with Arthritis: Data from the National Health and Nutrition Examination Survey 1999-2018. *Chronic Obstr Pulm Dis.* 2025 Jan 29;12(1):61-71.
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## 4. Case report on the management of spontaneous thyroid haemorrhage

### Introduction:

Thyroid nodules are frequent in the general population, with a higher prevalence in women. The incidence of thyroid nodules on palpation can be as low as 4-5%, whereas ultrasonography and autopsy investigations reveal a prevalence of up to 50-67% of individuals. Female sex, advancing age, iodine shortage, and a history of head and neck radiation or ionizing irradiation before the age of 18 are all risk factors for nodule development. Most thyroid nodules are benign follicular neoplasms, colloid nodules, cysts, and thyroiditis (80%); just around 5% are malignant.<sup>1</sup> Spontaneous intrathyroidal hemorrhage is a rare condition caused by trauma or ulceration of a large vessel. Management of this patient group mainly depends on the severity of bleeding and airway obstruction. Ultrasonography is the most effective approach for assessing tissue compression. Ultrasound-guided puncture or drain placement can be used for decompression in the case of fluid collection. If dyspnea is accompanied with an increase in neck size and hematoma volume, as well as hemodynamic instability, immediate intubation and surgical intervention may be necessary.<sup>2</sup> This case demonstrated a spontaneous hemorrhage into a thyroid cyst with airway blockage that necessitated surgical intervention.

### Case presentation:

A 42-year-old female experienced severe neck pain and a rise in nodule size, leading her to seek immediate medical attention. During a neck examination, a 6 cm x 8 cm mass on the right side was palpable and painful (visual analog scale score 4/10) (Figure 1). There was no indication of hyperthermia or hyperemia. Her blood tests showed slight anemia (Hb 112 g/L). Neck USG indicated a spherical, thick-walled, heterogeneous echogenicity with circulating blood flow in Doppler mode, measuring 84 mm x 48 mm in size. A USG-guided puncture was performed, and 40 mL of hemorrhagic content was extracted. The patient underwent right-sided hemithyroidectomy due to fast cyst growth, discomfort, tissue compression, and dyspnea (MRC dyspnea scale 3). Cefotaxime 1 g was given intravenously 30 minutes before surgery as antimicrobial prophylaxis. The surgery was conducted under general anesthesia. A collar

incision was made on the anterior aspect of the neck, avoiding crossing the pretracheal muscles. The thyroid gland was visible, and the left lobe, isthmus, and right lobe measured 4.0 cm by 2.0 cm by 1.5 cm, 1.5 cm by 1.0 cm by 0.5 cm, and 3.5 cm by 2.5 cm by 3.0 cm, respectively. The left lobe had a soft, elastic volumetric mass of 8.0 cm × 4.0 cm × 3.0 cm. The mass moved the trachea to the left. The thyroid cyst was successfully removed using bipolar coagulation (Figure 2). Further mobilization of the right lobe revealed heterogeneous nodes up to 1 cm in diameter. Hemithyroidectomy was performed using right recurrent laryngeal nerve visualization. An active suction drain was placed in the thyroid bed. The incision was sutured layer by layer with cosmetic stitches. During the postoperative phase, the patient was treated with NSAIDs (Ketorolac 30 mg IV) for symptomatic relief, and his serum calcium level remained within normal range during monitoring. Pathological examination of the right lobe of the thyroid gland revealed areas of moderate chronic thyroiditis without active inflammation. A macrofollicular growth pattern was observed in a colloid nodular goiter, along with cystic change. The right lobe of the thyroid gland showed edematous stroma, hyalinized stroma, compressed follicles resembling pseudoadenomas, and lymphocytic and histiocytic infiltration. The right lobe mass was a colloid goiter with cystic dystrophy, intraparenchymal hemorrhages, lymphocytic nonspecific thyroiditis with sclerosis, and follicular adenomas. On the third day after the surgery, the drain was removed, and a control USG was done. The results revealed soft tissue edema in the intervention area but no fluid accumulation. The patient was discharged from the hospital that same day.

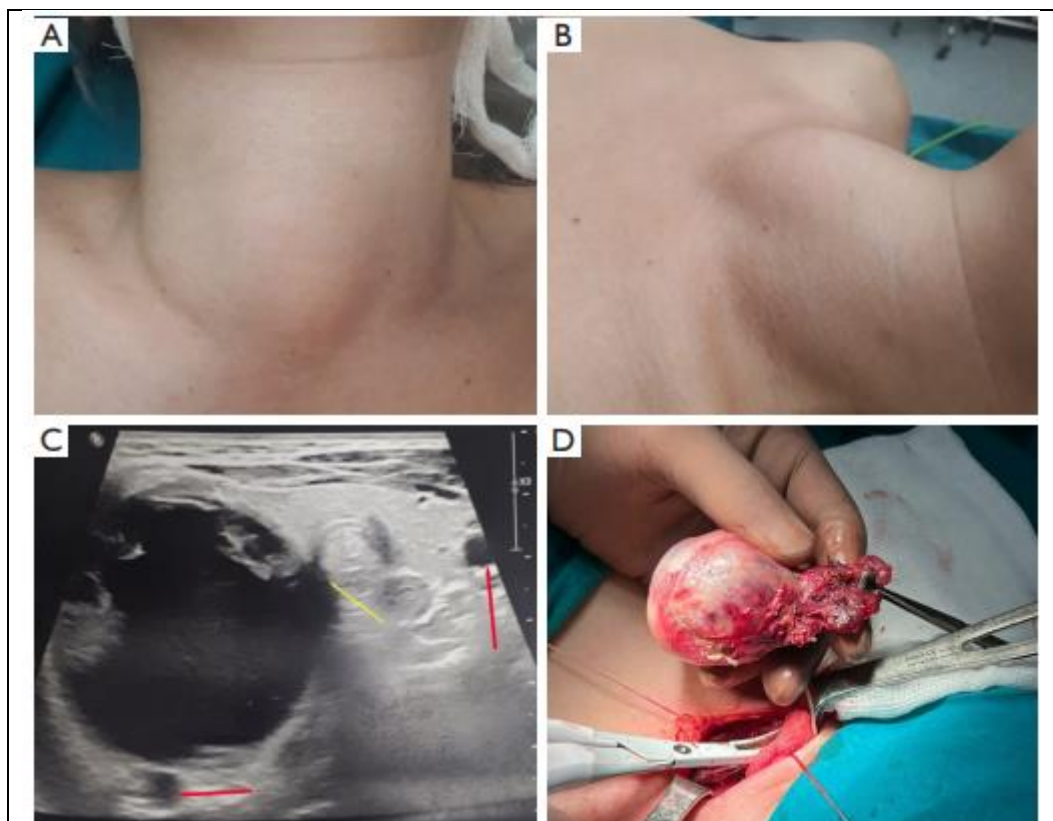


Figure 1: Preoperative and intraoperative images of the thyroid cyst. (A) Anterior neck mass; (B) Lateral neck mass; (C) USG of the right lobe thyroid cyst (red arrows indicate carotid artery compression; yellow arrow indicates tracheal compression); and (D) Intraoperative image of the right lobe thyroid cyst. USG, ultrasonography.

**Discussion:**

The use of thyroid imaging tools in everyday practice has increased the number of thyroid nodule diagnoses. Most of these nodules are cystic, with a cystic component of 60% or higher. Treatment options for cysts include ultrasound-guided puncture, ablation, and surgical removal. Thyroid cysts are typically benign and asymptomatic, making these treatments infrequent. Recurrence rates after puncture and aspiration are significant occurring 60-90% of patients.<sup>2</sup> A previous study showed that the surgical removal is a definitive treatment, but it may lead to more complications.<sup>3</sup>

**Conclusion:**

Spontaneous thyroid bleeding is an uncommon occurrence caused by a ruptured feeding vessel or erosion of the thyroid mass. Most cases have a good prognosis and can be treated conservatively with observation. On rare occasions, airway blockage caused by active bleeding may necessitate emergency surgery and intubation.

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Spontaneous thyroid bleeding is a rare occurrence caused by a ruptured feeding vessel or thyroid mass erosion. In case of bleeding into the thyroid cyst, aspiration or draining to decompress the airways are needed and in continuous bleeding, hemithyroidectomy is required.

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