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Case Report

Case Report of Pleural Effusion Which Is Due To Hypothyroidism

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Abstract: Background: Pleural effusion has been supposed to be a rare complication of hypothyroidism while it is notes that are mostly associated with ascites, cardiac failure and cirrhosis. Isolated pleural effusion finding in hypothyroidism is mostly rare. The objective of this case report was to determine the frequency and clinical findings of hypothyroidism and pleural effusion. **Methods:** The medical record of a patient with pleural effusion which was associated with hypothyroidism (increased level of TSH) was reviewed. **Results**: The treatment is given with levothyroxine and liothyronine for couple of weeks, and there was improvement of patient's condition both clinically and laboratory evidences. The effusion which was present has been disappeared. **Conclusion:** Pleural effusion which is caused by hypothyroidism is an infrequent entity.

Keywords: Pleural effusion, hypothyroidism, thyroid gland, hormone

1. Introduction

Hypothyroidism (also named hypoactive thyroid, decreased thyroid or hypothyreosis) is explained as the deficiency of thyroid gland to secrete the adequate amount of thyroid hormone to compensate the metabolic requirements of physique.(Kravets, 2016) Hypothyroidism occurred due to many reasons. When it is caused by insufficient performance of the gland itself then it is called primary hypothyroidism, & when it is due to insufficient provoke by thyrotropin-stimulating hormone (T.S.H) from the hypophysis follicle, then it is described as secondary hypothyroidism. However tertiary hypothyroidism defined as diminished discharge thyrotrophin-releasing hormone from the hypothalamus(Association et al., 2011). Hypothyroidism can be classified as iatrogenic and apparent. In iatrogenic hypo-thyroidism two levels of thyroid hormones are measured i.e., free TSH which is more than the upper reference limit and the level of free thyroxine (T4) which is within normal range. It is pertinent to mention here that it is only possible when there is stability of thyroid function for than weeks, or the axis of pituitary- hypothalamic–thyroid is normal, & nearby is no topical or unending serious ailments. In overt hypothyroidism there is an increased level of TSH, normally more than 10 mIU/L and the level of free T4 should be subnormal(Baskin et al., 2002). When the hypothyroidism has mysterious commencement, varied features, and the clinical features are non-specific then there are more chances of misdiagnosis & missed diagnosis. In the respiratory system pleural effusion is one of the communal ailments. Pleural effusion may be due to cardiac failure, hypoproteinemia, cirrhosis of liver, nephrotic syndrome, tuberculosis & malignancy (YU, Jiang, Wang, & QU, 2016). Clinically there may be hypothyroidism & pleural effusion however pleural effusion which has occurred due to hypothyroidism is comparatively infrequent. Hence, mostly physicians did not give full concentration to pleural effusion who have the etiology of hypothyroidism it led to an increased rate of quantifiable unexploited analysis & misdiagnosis. This paper, remind the physicians to give full consideration to diagnose hypothyroidism & to evade or decrease the mis diagnosis and mis treatment.

2: Materials and Methods

2.1 Case study

The 47-years male having clinical features of frequent chest & backbone aching beyond over three months, which was intensified for 07 days & he also had violent puffiness and pain, which was most noticeable in the sub scapular region & in front of chest below the costal margin. The

case study was carried out in Shakar Garh district Narowal (Punjab). There was no cough, but have fever of 100F to 101°F, and had nocturnal sweating. There was no tightness of chest, difficulty in breathing, no tremble, cardiac pain. There were no GIT symptoms like nausea, vomiting, pain in the abdomen, heaviness in the epigastrium and loose motions. But there is minor edema of lower extremities.

On examination dated 25/09/2022, general physical examination (GPE): Temperature: 100˚F, Pulse: 83 beat/minute, Respirational rate was: 23 per minute & the B.P was 160/90 mmHg.

The symmetry of the chest cavity was basically normal, whereas the breathing and the chest movement was alright. There was slight weakness of the chest on the left side and there was no friction of the pleura or subcutaneous winding feeling was affected. On examination of the chest dull sound was noted on both sides. On auscultation breathing sounds were normal on both sides. No extra sound was noted like crepts or wheezing. Consensual vocal sound transmission was normally. There was no friction of pleura. Hear Rate was: 78/min, which was consistent, no extra unreasonable whispers, no pericardiac roughness hums in individually valve region, no edema in individually lower extremities. Lab. Investigations were performed, the data showed the following liver function tests, total bilirubin 0.66 mg/dl (1 mg/dl) , alanine transaminase (ALT) 18 u/l (5-40 mg/dl), aspartate aminotransferase (AST) 16 u/l, alkaline phosphate 168 u/l (40-129 u/l), albumin 4.29 (3.5-5.2) globulin 3.6 (2.0-3.5 g/dl), serum amylase 29 (28-100 u/l), serum cholesterol 126 (<200), triglycerides 247 (<150 milligramg /deciliter), uric acid 6.9 milligram/deciliter (3.5-7.2 mg/dl) plasma glucose fasting 200mg/dl, urea 33mg/dl, creatinine 1.00 md/dl (0.73-1.18) trop I 0.03 (0.0-0.03ng/ml), blood urea nitrogen (BUN) 15 (8-22 mg/dl), TSH 24.91 (0.34-5.6ulU/ml) echo shows normal biventricular systolic function, computerized tomography (CT) scan chest with high resolution shows cardiomegaly with right minimal and left mild pleural effusion and cholelithiasis, urine pus cells ++, urine plosive consonant blood negative and glucose and albumin was negative. C-reactive protein was 11.56 mg/l, routine examination of blood, and renal function test, stool examination blood coagulation profile, cancer indicators were all normal. Results: Thyroid function tests were Free T3 3.64 pmol/L, Free T4 6.10 pmol/L, while Thyroid stimulating hormone was 32 mIU/L. Electro cardiograph was done which had regular and sinus rhythm. The lung function tests were normal. Color doppler scanning of tummy & urinary tract exhibited no irregularity. Ultra sound of upper body having pleural effusion on left side of chest. Chest x-ray was done which showed obliterated C.P (cardio phrenic) angle on left side. High resolution computerized tomography (HRCT) of the chest displayed hoop sleuth of mid portion of left pleura. After tapping the liquid from the chest routine examination was done and have the following characteristics, Typical findings of normal pleural fluid are as follows: Appearance: transudative pH: 8.0, Protein: 1.0 gram/d, White blood cells (WBC): 70/mm³ Glucose: 20mg/dl lactate dehydrogenase (LDH): 33 % plasma concentration Cholesterol: 7 mmol/ Acid-resistant bacilli & cells of cancer were not present. Blood culture was done which showed that no growth was found. The test for Tuberculosis IGRA (interferon gamma release assay) was also done which was negative. The ultrasound of thyroid gland was also done which showed no thyroid lesions. The patient was treated with tablet thyroxine 50 µg daily once. Laboratory test of thyroid and HRCT was repeated chest color doppler ultrasound examination was repeated after one month which presented the subsequent results: Free T3 2.36 pmol/l, Free T4 11.12 pmol/l, TSH 18.24 mIU/l; and there was no pleural effusion on both sides.

2.2. Study site

The medical records of the patient with pleural secondary to hypothyroidism between September 2022 and December 2022 were reviewed. The case report was carried out in Shakar Garh district Narowal.

3. Results

The treatment is given with levothyroxine and liothyronine for couple of weeks, and there was improvement of patient's condition both clinically and laboratory evidences. The effusion which was present has been disappeared.

4. Discussion

Hypothyreosis (Hypo-thyroidism) is a term which is described as is a collection of endocrine illnesses instigated by the inadequate production, excretion and organic consequences of thyroxine, the thyroid hormone(Yuan, Yan, He, & Medicines, 2019). Another way this is called concealed ailment. It has different experimental appearances. Mostly affected persons having non- specific clinical features. Classical signs and symptoms are: improved awareness to cold, insignificance, tiredness, exhaustion, sluggish speech, amnesia, poor attentiveness, sadness, memory diminishing,

diminished hunger, belly distension, parched & coarse skin, constipation, thinning and loss of hair, increased weight, decreased hemoglobin, decreased heart rate, oedema etc.(Gottehrer, Roa, Stanford, Chernow, & Sahn, 1990) When we review the literature it is noticed that very less reports showed pleural effusion as the 1st presentation, whereas such types of scenario are likewise low. When there is such type of presentation then the diagnosis will be missed and led to mis-diagnosis. The pleural effusion due to hypothyroidism may be exudative or it may be transudative (He, Xue, & Mistreatment, 2008). In those patients who have exudative effusion there are increased chances that the diagnosis of tuberculosis or malignancy may be missed or mis-diagnosed comprised on communal ailments. In current situation here are some researches on pathological process of pleural effusion which is due to hypothyroidism. It may be due to amplified vessel porousness which resulted due to the decreased levels of thyroxine. Researches have shown that thyroid hormone can affect the coordination of vascular endothelial growth Factor (vascular endothelial growth Factor, (VEGF) appearance (Korayem et al., 2017), & due to this there is significantly increased level of VEGF in pleural effusion(Li, Teng, & Jiang, 2014). The capillary porousness which has occurred is rapid and it is reversible (Hataya et al., 2007). Nevertheless, the tablets of thyroxine which are given orally they slowly reduce the local level of VEGF & decrease the pleural effusion. It is suggested that VEGF have a significant part in the maintenance of capillary penetrability which has occurred due to hypothyroidism. At the end it is recommended that, physicians must reinforce the basic hypothetical information, improve the investigative cognizance of pleural effusion triggered by hypothyroidism, & recompense sufficient consideration to pleural effusion which have occurred due to hypothyroidism.

5. Conclusion

There may be involvement of different organs in hypothyroidism and the clinical features may be various. It is quite simple to diagnose the classical cases but it is not necessary that all cases may have classical signs and symptoms or may present with clinical features of only one system. Suchlike problems when diagnosed then there are chances that the diagnosis may be made wrong or the analysis could be unexploited. However pleural effusion which occurred due to hypothyroidism and due to other causes, have many resemblances, such cases need proper history & complete bodily checkup in quantifiable toil. To evaluate a wide-ranging scrutiny of features of sufferers with pleural effusion & required to instructed out extra reasons of incongruities. Assuming the through relationship amongst pleural effusion and hypo-thyroidism, investigation could be completed & matching action can be prearranged. Consequently, clinically, for sufferers who have pleural effusion in the making to be diagnosed at diverse eternities, physicians must demeanor screening of thyroid function, however the importance is quiet to eliminate communal ailments e.g Koch's, malignancy & cardiac failure to decrease & elude misdiagnoses & action.

8. Limitations and Recommendations

The Pakistan Demographic and Health Survey (PDHS) is a nationally representative survey that collects information on various health indicators, including childhood vaccination. This study was based on secondary data from the PDHS 2017-18. However, like any other study, there are some limitations to consider. Although the PDHS is designed to be nationally representative, the survey may not capture specific subpopulations or regions. So, the present study also carried with this limitation. Furthermore, this study analyzed only the parental demographic attributes of incomplete childhood vaccination but did not collect detailed information on the reasons why some children could not receive certain vaccinations. This information could provide valuable insights into barriers to vaccination and inform targeted interventions. The PDHS is conducted every few years, so the data of the present study may need to reflect current vaccination coverage rates. As a result, it is critical to keep these limitations in mind when conducting future re-search studies in Pakistan.

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Institutional Review Board Statement: Ethical review and approval were forfeited for this study, because the medical record of the patient was reviewed.

Conflicts of Interest: The author declares no conflict of interest.

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