

Adult Patients from One Nephrology Center with Renal Amyloidosis: Epidemiological, Clinical, and Laboratory Profile

Abstract

One of the primary differential diagnosis for nephrotic proteinuria in adults and the elderly is renal amyloidosis. This study with the most significant series in our nation aims to add to the clinical, etiological, and epidemiological research on renal amyloidosis. In a retrospective analysis conducted between 1975 and 2019, 310 cases of renal amyloidosis with histologically verified and typed were chosen for this investigation. The average age was 53.8 15.4 years, with 209 men and 101 women in attendance (range, 17–84 years). Of the 310 cases, renal amyloidosis AA was found in 255 (82.3%) and non-AA amyloidosis in 55 (17.7%). AA amyloidosis was primarily brought on by infections, with tuberculosis being the most common aetiology. An average of 177 months passed between the development of the underlying condition and the diagnosis of renal amyloidosis. At the time of diagnosis, nephrotic syndrome (84%), chronic renal failure (30.3%), and end-stage renal disease (37.8%) were the most prevalent symptoms. Mortality occurred in 60 cases after a mean follow-up of 16 months (range, 0-68 months). Given the high prevalence of AA amyloidosis in our nation, preventing the occurrence of this dangerous disease requires increased awareness of the right management of infectious and chronic inflammatory diseases.

Keywords: tuberculosis • chronic kidney disease • kidney transplantation • diagnosis • epidemiological • clinical nephrology

Introduction

From plasma cell dyspraxia to persistent inflammatory diseases, there are many different disorders that might lead to systemic amyloidosis. The occurrence of hereditary amyloidosis as a mutation in a protein with no amyloid or as a mutation that affects the amyloid protein itself can also be the reason. Renal amyloidosis predominates in numerous types of systemic amyloidosis in spite of this biochemical and etiological variability. It stands for one of the primary differential diagnosis for adult nephrotic proteinuria. To effectively treat the underlying illness, particularly in light chain (AL) amyloidosis, whose prognosis has greatly improved over the past ten years thanks to more effective treatment, the aetiology must be determined [1].

Our goal was to identify the epidemiology, clinical symptoms, and aetiology profile of

renal amyloidosis with albuminuria in adult and geriatric patients in Tunisia. We think that our experience can add to understanding of this disease given the dearth of research in developing nations. In a retrospective analysis done at Charles Nicolle Hospital's Department of Internal Medicine A, we looked at the records of patients with biopsy-proven amyloidosis who were seen over a 44-year period, from 1975 to 2019. All people hospitalised for renal involvement whose amyloidosis was histologically confirmed and classified in our unit were included. Patients with inadequate clinical information, no amyloidosis typing, and amyloidosis that were confirmed were excluded from this investigation [2].

Methods and Materials

It was a cross-sectional observational

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study carried out at the tertiary care Dr. Ram Manohar Lohia Hospital in New Delhi and the Department of Internal Medicine at PGIMER. The study was conducted between May 2011 and April 2013. After receiving informed written agreement, 200 consecutive patients who had an ultrasound-detected liver abscess were added to the study. All liver abscess patients who needed treatment and met the following criteria were included: left lobe abscess, abscess size >5 cm, impending rupture (1 cm liver tissue between abscess and liver margin), and failure to respond to conservative care after 48 hours. Patients under the age of 18, those with organised abscesses, those with abscesses near significant arterial systems in the liver and pregnant women were excluded [3].

On a pre-made Proforma, the patients' thorough medical history, clinical examination, and laboratory profile were documented. The CAGE questionnaire was used for the screening of "alcoholism." Patients were categorised as nondrinkers, occasional drinkers (alcohol consumption 3 times/week), and regular drinkers (alcohol intake 3 times/week) based on how often they consumed alcohol. Patients were categorised into three socioeconomic classes—upper, middle, and lower—using a modified version of Kuppuswamy's Socioeconomic Status measure. Complete hemograms, liver function tests, kidney function tests, and coagulation profiles (PT/INR) were performed on all patients. The reference ranges of the hospital laboratory served as the basis for these investigations' reference ranges. Cultures of blood and urine were sent. Serologies for HIV, hepatitis B and hepatitis C viruses as well as *Entamoeba histolytica* were performed. Chest radiographs and the Mantoux test were administered to all patients, to rule out pulmonary Koch's disease, patients with coughing and expectoration symptoms had their sputum tested for acid-fast bacilli (AFB) using ZN staining [4].

All patients had ultrasound-guided liver abscess aspiration using a pigtail catheter or a percutaneous needle after giving their informed consent. Interventions were carried out for patients who had coagulopathy after their INR was corrected to < 1.4. In a single, sizable (>10 cm), deeply seated, and partially liquefied abscess, we recommended a pigtail catheter. We typically employ a percutaneous catheter in several, small (5-10 cm),

superficial, and totally liquefied abscesses. The aspirate was promptly forwarded to the microbiology department for microscopic evaluation of the wet mount for *Entamoeba histolytica* trophozoites, Gram's staining, and ZN staining for AFB. In aerobic, anaerobic, and fungal culture mediums, samples were plated. Patients were empirically started on intravenous ceftriaxone and metronidazole till pus culture report was received. The normalisations of hemodynamic state along with the resolution of the presenting complaints were deemed the criterion for discharge. All data were gathered into an MS Excel spread sheet and analysed with SPSS version 19. For continuous variables, the mean, median, and standard deviation were computed. For the test of association, the chi-square test and multivariate regression analysis were used [5].

Discussion

Renal amyloidosis still affects a substantial number of people in our nation, far more than the 0.65–4% stated in various studies. The steady development of additional nephrology facilities in our nation has led to a decline in the number of cases since 2004, nonetheless. The median age at diagnosis in the current study was 54 years, which is comparable to undeveloped countries but lower than industrialised ones. One-fourth of our patients were over 65. According to reports, an amyloidosis is the most prevalent type of amyloidosis in children and young people. In this study, amyloidosis was type AA in all patients 30 years of age or younger; after 50 years, the percentage fell to 76.7% [6].

According to statistics from the literature, our patients with non-AA amyloidosis were significantly older (58.5 years) than those with AA amyloidosis (52.8 years). Men were more impacted than women in terms of gender. For several authors, the distribution was comparable. Others, however, claimed that women had a similar or stronger propensity. According to our findings, the gender predominated in both non-AA (61.8%) and AA (68.6%) cases. While some earlier studies came to similar conclusions, others demonstrated that women were more vulnerable to AL amyloidosis. In this study, men had a higher prevalence of AA amyloidosis, which was partly attributed to a higher incidence of chronic bronchitis linked to increased smoking.

AA amyloidosis was more prevalent than non-AA amyloidosis in our cohort (82.3 vs. 17.7%). This discrepancy can be explained in part by a bias in patient inclusion that favours patients with lower socioeconomic status [7].

The latency period from the start of the inflammation and the first clinical manifestations was 182 months in our patients with renal AA amyloidosis, which is comparable to that described in the literature. An ongoing inflammatory condition leads to the deposition of AA amyloid fibrils. The serum amyloid A (SAA) levels can be checked and utilised to direct therapy response in several developed nations. The likelihood of developing amyloidosis is influenced by additional genetic and environmental variables. The SAA1 locus, one of the two genes encoding SAA proteins, contributes to amyloidosis sensitivity. In our experience, neither the sequencing of the SAA1 gene nor the quantification of SAA levels is widespread practices. In this study, infections accounted for the majority of AA amyloidosis cases, with tuberculosis being the most frequent cause. The most typical cause of renal amyloidosis, according to other studies, is TB. The additional infection types that were described in our patients are comparable to those that were reported in previous series. However, echinococcosis was quite unusually frequent in our area [8].

The second cause was chronic inflammatory disease, which were primarily rheumatic disorders and chronic polyarthritis. This condition is still common because there aren't any new, efficient treatments for it. Since consanguineous marriages are still common in our society, hereditary auto-inflammatory syndrome, which is linked to a number of periodic fevers-of which familial Mediterranean fever is the best known-, is not a negligible cause. Homozygous carriers of the M694V mutation who have familial Mediterranean fever are more likely to develop amyloidosis. The high prevalence of this mutation in our group can help to explain a portion of the high prevalence of inherited auto-inflammatory disorders among our cases. As previously mentioned, AA amyloidosis has also been linked to malignancies, chronic inflammatory illnesses, inflammatory bowel disease, and Behcet's disease.

In comparison to earlier reports, which

ranged from 6% to 9.9%, we found a higher frequency of AA amyloidosis with no illness detected (17.4%). This is unquestionably the result of a misdiagnosis, primarily of genetic kinds, connected to an intrinsic error of inflammatory response in the immune system. Castleman's disease should be looked at if there is AA amyloidosis present without a clear cause. Our findings contrast significantly with research from industrialised nations where amyloidosis was type AA-only 4.8% to 40%-and the chronic inflammatory disorders were the most prevalent cause-where amyloidosis was the most common type. With an estimated frequency of 12 cases per million people per year, AL amyloidosis is more common in industrialized nations [9].

In this investigation, it proved unreliable to diagnose the non-AA amyloidosis aetiology. The prevalence of myeloma was undoubtedly overestimated, particularly in older files where the diagnostic standards have continued to evolve. Additionally, some cases of transthyretin amyloidosis may have gone undiagnosed due to a lack of genetic or MS research. The major issue that has arisen in recent years is identifying hereditary amyloidosis, correctly diagnosing it, and distinguishing it from AL. The most prevalent hereditary amyloidosis in the world is called ATTR amyloidosis, which is generated from a transthyretin variation. According to recent studies from developed nations using radiolabeling serum amyloid protein 123 I (123 I-SAPS), a sensitive method for detecting the visceral amyloid deposits, even in tissues not thought to be clinically involved, the frequency of extra renal manifestations in our patients does not quite agree with those studies.

Due to the lack of widespread usage of biomarkers such cardiac troponin, N-terminal pro-BNP, and magnetic resonance imaging at our institution, the assessment of cardiac involvement is generally understated in our study. Regardless of the amyloid type, the clinical picture of renal involvement is typically the same. For amyloid nephropathy, a precipitating cause frequently exists. Although the main contributing cause in our patients was lung infection, surgery revealed renal amyloidosis in 6.8% of cases [10].

Conclusion

The most frequent pattern in our sample

was a young, alcoholic male from a lower socioeconomic level with an amoebic liver abscess that presented as a single right lobe abscess. Female patients rarely had liver abscesses. Apart from amoebic and pyogenic liver abscesses, tubercular liver abscesses were rather common. Despite the fact that patients' average age was in their forties, patients in the seventh decade had a higher risk of mortality. The symptom of cough suggests a considerable pleural effusion is present. Ascites should raise concerns about TLA or any associated CLD. Patients undergoing surgical intervention for rupture had a significant mortality rate. The fact that all patients received aetiology-specific antimicrobials and minimally invasive draining procedures contributed to the overall mortality being low.

Conflicts of Interest

None

Acknowledgments

None

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