

## Chapter 46

# Senior Adults Living with Primary Immunodeficiency Diseases

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Primary immunodeficiency disease (PI), frequently thought of as a disease occurring in infants and children, may in fact be more common in adults. Health care providers who think of PI as a pediatric disorder may miss the diagnosis of PI in older adults and geriatric individuals. The convenience and efficacy of antibiotics may also masquerade the diagnosis of PI, resulting in prolonged delay of the correct diagnosis. In the geriatric age group, there are special problems and special needs which require attention:

- **Complications:** Many senior adults have had PI for years and, consequently, have developed complications such as chronic lung disease (including bronchiectasis), chronic sinusitis (often with a history of multiple sinus surgeries), and infections with microorganisms resistant to multiple antibiotics.
- **Comorbid diseases:** Comorbid diseases such as heart disease, diabetes, kidney disease, arthritis, and other chronic medical problems, take on significance of enormous proportions when combined with PI.
- **Frailty:** Due to possible physical and mental issues, some seniors may not be able to navigate the requirements of taking care of PI themselves.
- **Third party coverage and bureaucracy:** This age group is almost always covered by government insurance (Medicare). Medicare regulations are not always "PI Friendly" making the effective care of these individuals difficult.

## The Senior Individual

This age group includes the population of 60 years and older. Little has been written about PI in this age group, and the prevalence of PI in this age group

has not been appreciated until recent evaluation from a large database (see Figure 46:1) and from unpublished data from the Immune Deficiency Foundation. Immunodeficiency in the senior population looks significantly different than it does in younger groups. Unlike children, who may have many different kinds of immune deficiency disorders, the majority of adults with PI have antibody immune defects. Some may have a recent diagnosis of PI, while others, have had their diagnoses for decades. Similar to younger individuals, seniors may present with severe or frequent bacterial infections or infections with unusual organisms.

Common Variable Immune Deficiency (CVID) and Specific Antibody Deficiency (SAD) are the most common diagnoses in these individuals. Studies have shown that as these individuals increase in age, they often have an increased number and severity of comorbid conditions. Another more recent change has been the "uncovering" of PI or triggering of secondary immunodeficiency (SID) due to biologics used to treat a comorbid disease. These comorbid disease complications have been described in other sections, but they may have an increased significance in this age group, and produce greater risks for some interventional diagnostics and therapies.

## Progression of PI Related Problems

Sinopulmonary disease may progress over time, leading to multiple sinus surgeries and insidious, progressive lung disease. Lung disease may include bronchiectasis with resistant organisms, COPD, pulmonary fibrosis with hypoxemia, and granulomatous lung disease. Early recognition and treatment may help to control the progression. However, some may eventually require aggressive intervention and/or oxygen supplementation.

Gastrointestinal disease may lead to increased intestinal infections, malnutrition, protein and fluid loss from chronic diarrhea, including loss of immunoglobulin (IgG).

Inflammatory bowel disease, malabsorption and bacterial overgrowth syndrome may occur as well. Malignancies also increase with age. Unexplained weight loss, fatigue, and careful examination for anemia and blood loss in the stool can alert the physician to gastrointestinal malignancies.

Careful and vigilant monitoring for proliferative diseases (lymphoma, myeloma and leukemia) is extremely important as increasing age incurs a higher incidence of malignancies leading to the need for chemotherapy. Chemotherapy itself has profound effects on individuals and more so in seniors. Sometimes, either before or after chemotherapy, the individual is found to have decreased IgG with or without infections. If no prior laboratory studies documenting Ig levels are obtained before the treatment of lymphoma or leukemia, it may be impossible to say which disease occurred first (CVID or lymphoma or leukemia).

Secondary immunodeficiency can occur when another disease, such as lymphoma, leukemia, myeloma or benign monoclonal gammopathy, abnormal proteins in the blood, causes a decrease in IgG and possibly in other serum immunoglobulins, including IgA and IgM. Ig replacement therapy may be required in these disorders. In addition, treatment of these malignancies with chemotherapy or certain biologics (rituximab and ocrelizumab, etc.) may exacerbate an underlying immunodeficiency by destroying lymphocytes which produce immunoglobulins.

## Consequences of Aging

Aging leads to worsening of other diseases including diabetes mellitus, kidney disease, neuropathies, dementia, arthritis, Parkinson's disease, and hypertension. Many of these diseases or disorders may have profound implications on how Ig therapy will be given. This includes dose, frequency and route of administration, product selection and site of care. Less rapid administration and lower doses in older individuals are important in geriatric individuals, especially in those with renal disease. Further, this age group has a higher risk for blood clots including phlebitis (inflammation of the blood vessels), myocardial infarction, stroke, and pulmonary

embolism (clots in the lungs). This risk is higher in individuals with previous thrombotic conditions or blood clotting diseases, particularly for those with limited mobility.

While Ig replacement therapy may be administered by either intravenous immunoglobulin replacement therapy (IVIG) or subcutaneous immunoglobulin replacement therapy (SCIG), it may be medically necessary to choose the subcutaneous route in individuals with underlying renal disease, severe heart disease, clotting disorders, hypertension or other conditions where large volumes of IVIG, if infused rapidly, may be detrimental. Infusions with IVIG can also transiently increase the osmolarity (thickness of the blood) which may have adverse effects on clotting and kidney function.

## Administration of Immunoglobulin

As previously mentioned, there are two ways in which you can receive Ig replacement therapy, IVIG and SCIG. In general, many go towards SCIG, governed by convenience, safety and insurance prerogatives. A study has shown that seniors can tolerate and self-administer SCIG safely. Even those on anticoagulants can safely administer SCIG. Generally, someone who is newly diagnosed with very low IgG levels are given a "loading dose" of IVIG followed a week later by weekly or biweekly SCIG. The reason for this process is to get protective levels of serum IgG up rapidly.

Some elect to receive IVIG because it is given every three to four weeks, rather than weekly, and do not wish to self-infuse. However, because of insurance considerations, particularly Medicare, and convenience considerations, many elderly individuals self-infuse at home. Currently, it is unknown how many receive their treatments through IVIG or SCIG. While SCIG may be convenient for some, it may present special problems for many elderly individuals who have physical limitations. Self-infusions require a number of preparatory steps to infuse, some of which may not be possible for those with arthritis, poor eyesight, muscle weakness or other frailties. Oftentimes a caregiver is required for those with SCIG, although in one study 83% self-infused. If there is no caregiver, this therapy may present considerable obstacles to self-infusion. Other concerns are that Medicare does not pay for nursing support for self-infusion. A significant problem is that SCIG in nursing homes or attended care settings may be difficult because of cost considerations.

## Insurance Issues

The majority of individuals in this age group have Medicare coverage and it is important to talk to someone who can advise you on your different plan options. You can contact your State Health Insurance Assistance Program (SHIP) to find trained counselors who can tell you the plans you are eligible for and assist you in finding the answers to your questions regarding coverage. To find your state's SHIP program contact information, go to <http://bit.ly/SHIPprograms>.

There are many options when it comes to Medicare so understanding your plan's coverage is extremely important. Choosing the wrong plan can impact your health and finances. For more information visit the IDF Patient Insurance Center: [www.primaryimmune.org/insurance](http://www.primaryimmune.org/insurance). If you have further questions, contact IDF: 800-296-4433 or [www.primaryimmune.org/ask-idf](http://www.primaryimmune.org/ask-idf).

## Summary

PI is more common in adults than children. As a special group, seniors, may be the most complicated to treat for all the reasons described above.

## References

PI is more common in adults than children. As a special group.

1. Verma N1, Thaventhiran A, Gathmann B; ESID Registry Working Party, Thaventhiran J, Grimbacher B. Therapeutic management of primary immunodeficiency in older patients. *Drugs Aging* 30 (7):503-12, 2013.
2. Stein MR1, Koterba A, Rodden L, Berger M. Safety and efficacy of home-based subcutaneous immunoglobulin G in elderly patients with primary immunodeficiency diseases. *Postgrad. Medicine* 123(5):186-93, 2011.
3. Cornett A, Kobayashi RH: Moving Aging Ig Patients into Nursing Homes. *IG Living* Oct-Nov 2017.pp 18-20.

# Age distribution of 235 individuals with PI in the Consortium of Independent Immunology Clinics patient registry.

Figure 46:1

