Sesquicentennial of the birth of Edmund Faustinus Biernacki, a discoverer of the erythrocyte sedimentation rate

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Abstract

Edmund Faustinus Biernacki (1866–1911) was a Polish physician and philosopher of medicine. He described erythrocyte sedimentation, designed equipment to measure the erythrocyte sedimentation rate, and applied it to clinical practice. His contribution to the development of one of the most commonly used medical laboratory tests is forgotten, and the test is attributed to other scientists.

Key words: Biernacki, Edmund Faustinus, erythrocyte sedimentation rate, history of medicine, biography.

This short paper pays tribute to Edmund Faustinus Biernacki, a great Polish physician on the occasion of the sesquicentennial of his birth. Despite his relatively short life (Biernacki died at age 45), he left a significant legacy to medicine (Fig. 1). His most important discovery, the application of measurement of the rate of erythrocyte sedimentation, is often forgotten and attributed to other scientists (Fåhræus, Westergren) or to those who had described earlier the phenomenon but had not introduced it into clinical practice.

The erythrocyte sedimentation rate (ESR) was probably the most widely applied laboratory test in medical practice. As time went on, the ESR was substituted by other so-called acute phase reactants, and sometimes was considered an old-fashioned or outdated medical laboratory procedure. On the other hand, rheumatologists still apply the ESR, e.g. in calculation of indices of rheumatoid arthritis activity. Summing up, ESR is an important test and its introduction to clinical medicine more than a century ago was a significant stride forward in medicine [1].

Application of bloodletting as a therapeutic measure was probably the first source of observation of the difference in clotting of blood obtained from patients with fever. Their blood formed a clot known as “crusta phlogistica” [2, 3]. Later the phenomenon was described by various physicians, including Richard Davies (in 1760), William Hewson (in 1772), John Hunter (in 1774), and Christian Friedrich Nasse and Hermann Nasse in 1836.

Fig. 1. Edmund Faustinus Biernacki (photo about 1905).

Edmund F. Biernacki was the first scientist to design a special glass tube or cylinder to measure the ESR, and reported different rates of sedimentation in patients with several disorders, including rheumatic fever (Fig. 2). He all of them just tested the speed of erythrocyte sedimentation, and some of them noticed a difference in the rate in various blood samples [4].

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published his papers on the ESR in 1894 and 1897 in Polish and German [5–10] (Fig. 3–5). German in those days served as an international language of medicine, and it is surprising that Biernacki’s discoveries were not recognized by the medical world. In 1918, Robert Robin Sanno Fåhræus (1888–1968) tried to apply the ESR as a pregnancy test [11]. Later, in 1921, he reported increased ESR in patients suffering from various inflammatory states [12]. In the same year, Alf Vilhem Albertsson Westergren (1891–1968) described higher ESR in patients with tuberculosis [13, 14]. He substituted sodium oxalate with sodium citrate as an anticoagulant agent used for ESR measurement, and the currently applied method is known as the Westergren method. During the First World War, the Polish immunologist Ludwik Hirszfeld (1884–1954) published his observations on the ESR in patients with malaria, but his observations were unnoticed [15].

The Polish Society of Internal Medicine in 1923 adopted the term “the Biernacki’s reaction” (odczyn Biernackiego) for the ESR, and this term is used regularly in Poland [16]. Unfortunately, the discovery of Biernacki remains almost unknown in the world medical litera-
tute. One of the first papers on this subject published in a language other than Polish appeared in print in 1975 and later in 1987 [3, 17–20]. They were followed by other English-language publications. In 2011, Grzybowski [21] submitted a letter to the editor of the Journal of Rheumatology concerning the priority of Biernacki, and the role of Biernacki in the discovery of the ESR was confirmed by Matteson et al. [22], who had earlier attributed it to Fåhræus [23]. Despite the effort of the few Polish physicians interested in the history of medicine [24–26], it is not uncommon to find a currently published paper on application of the ESR in rheumatology (or other fields of medicine) containing wrong data on the discovery of the ESR (for example, Olsheker and Jerrard in 1997 [27] attributed the discovery of the ESR to the ‘German’ (sic) scholar Fåhræus). Erroneous data concerning the ESR also appear in several handbooks (see: Dąbrowski and Skotnicki [2]). The 150th anniversary of the birth of Edmund Faustinus Biernacki is another opportunity to highlight the life and achievements of the great physician.

Edmund F. Biernacki was born on the 19th of December, 1866, in the city of Opozno in the central part of Poland (łódź Province). In the 19th century, Poland was partitioned by Russia, Germany and Austria, and Opozno was located in the part occupied by the Russian Empire. His father, Adolf Biernacki, was an office worker and was a descendent of a Polish noble family with a coat of arms, “Poraż”. The family originated from the lands of Lithuania, and their estates were confiscated by the Russian authorities as a punishment for the family support for the Polish Independence Insurrection (called the January Insurrection). Adolf Biernacki was persecuted and forced to move from the land estate to the city. The mother of Edmund was Joanna Josephine from the noble family of Baranowski [28–30].

Edmund F. Biernacki attended high schools in Kielce and Lublin and completed his high school education in 1884. In the same year, he enrolled in the Faculty of Medicine of the Imperial University of Warsaw with Russian as the language of instruction [3]. Edmund F. Biernacki was a talented student. He was interested in physiology and carried out research. While still a medical student, he published his first papers [31, 32]. The student achievements of Biernacki were appreciated, and he was awarded the university gold medal for outstanding students (1888). After graduating in 1889 cum eximia laude Biernacki became an assistant of Professor Mikhail Zieniecz, the head of the Department of Internal Medicine at the Imperial University of Warsaw [33, 34]. A year later, he received a scholarship and went abroad. He worked in Heidelberg (Professors Wilhelm Heinrich Erb and Wilhelm Kühn), Paris (Professors Jean-Martin Charcot and George Hayem) and Giessen (Franz Riegel) [35–37]. On his return, Biernacki obtained the post of head of a ward at the Department of Diagnostics in Internal Medicine at the Imperial University of Warsaw under Professor Mikhail Zieniecz. Later, in 1897, he obtained the post of chief executive officer of the Municipal Hospital in Wola, a quarter of Warsaw. The Russian authorities hindered development of the hospital, and in 1902, Edmund F. Biernacki decided to move to Lvov. Lvov was a Polish city located in part of Poland partitioned by Austria. Poles had greater rights there than in other parts of Poland occupied by Russia or Germany [30].

Edmund F. Biernacki was a famous physician and scientist, and the Faculty of Medicine at Lvov University decided to waive him from the formal recognition procedure of the Russian diploma. He was also granted the post of associate professor. He became an Austrian citizen and worked at the university. From 1908, during the summer, Biernacki ran a medical practice in one of the most famous health resorts of Europe, in Karlsbad [38]. Edmund F. Biernacki died suddenly, probably due to rupture of a cardiac aneurysm, on the 29th of December 1911 in Lvov. He left his wife, Caroline Catherine née Rudoska from the Rumoka estate, near Warsaw. He married her in 1892. The Biernackis had one daughter, Ann (born 1892 in Warsaw), married name Bryłowa. Ann had no children [28, 29, 37].

Edmund F. Biernacki had two brothers, Victor Biernacki and Joseph Biernacki. Victor Biernacki (1869–1918) was a famous physicist and one of the first Poles to investigate radio waves. He was also a pioneer in the medical application of X-rays. Victor Biernacki demonstrated his first radiographs at the meeting of the Warsaw Medical Society on the 18th of February, 1896, while Wilhelm Conrad Röntgen discovered X-rays on the 8th of November, 1895. The second brother, Joseph, was an engineer and worked in the city of Kamienskoy (now: Dniepropetrovsk, Ukraine).

Edmund F. Biernacki was a very prolific scientist, and he authored almost one hundred research papers. Most of his studies were focused on hematology, but he also was interested in gastrology and general internal medicine. Biernacki was the author of the first Polish handbook of hematology (“Zarys patologii krwi”) (1908) (“An outline of blood pathology”) [39]. He described a new symptom, paralysis of the ulnar nerve in patients with long-lasting syphilis. The symptom is known as the Biernacki sign [40–44].

Another important field of interest of Edmund F. Biernacki is philosophy of medicine. He published a book on epistemology in medicine, “Istota i granic wiedzy lekarskiej” (1899) (“The nature and limits of medical knowledge”) [45]. The book was translated into German and
is currently considered a classical publication in medical philosophy [46]. He also authored the paper “Co to jest choroba” (1905) (“What is the nature of disease?”) [35].

Edmund Faustinus Biernacki died in Lvov and was buried at Tyczakowski Cemetery. In 2015, Professors Zbigniew Dąbrowski and Aleksander Skotnicki initiated collecting funds for renovation of the run-down tomb of Biernacki. The tomb was located. The Polish Society of Rheumatology contributed to the funds. Thanks to the activity of the above-mentioned professors, the Polish Post issued a stamp commemorating Edmund F. Biernacki.

The ESR is a well-known laboratory test, widely applied in clinical practice [47–49]. Despite its application for decades, there is a lack of cognizance of the Polish inventor of the test, and rheumatologists should contribute to the promulgation of the history of the ESR and the role of its discoverer, Edmund Faustinus Biernacki.

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