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REVIEW

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Recipe from the Past for the Future: Public Health Intervention Represent a Process for Century

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In the poor Bosnia, in the early 20th century endemic syphilis was widespread. Combating this disease entailed the necessity of etiology research, diagnosis and clinical nature of the disease, as well as the insight into the epidemiological image of this unresolved health problem. Thanks to the visionary, the enthusiasm and persistence of the expert team of doctors from that time in Croatia, School of Public Health and the Rockefeller Foundation as financial support, conditions were created to conduct population monitoring and research called “survey”. The team of experts from Croatia and Bosnia led by Dr. Ante Vuletić began this important public health intervention in Central Bosnia underneath the mountain Vlasica 1934. In villages of mountain Vlasica people were living in very difficult social and unsanitary conditions. “Interviewers” worked in makeshift clinics in the rural schools Opore, Rankovici, Vitovlje Mehovica, Turbe, Bila and Gornji Vakuf. A hundred years later, a team of university professors from the School of Public Health “Andrija Stampar” led by Professor Silvije Vuletić followed the footsteps of century “survey” on Vlasica in the summer of 2014. They determined that with the integrated approach to population monitoring and testing endemic syphilis in Bosnia was successfully suppressed.

Key words: public health, endemic diseases, Croatia, Bosnia and Herzegovina.**1. INTRODUCTION**

It's been over 80 years since the beginning of the first organized campaign of medical experts for the eradication of endemic syphilis in Bosnia and Herzegovina (BiH, “Bosnia”) which was initiated by the School of Public Health in Zagreb. Endemic syphilis spread among poor Bosnian peasants of eastern and central Bosnia and Herzegovina. That were unfortunate and difficult times when in Bosnia was lived in order to survive and died without a trace of existence (1914- 1941).

In the period from 1914 to 1955 in Bosnia was carried out one of the major interventions in the history of public health in our countries. From idea, preparation and decisions for this campaign passed seven years (1). Doctor Lovro Dojmi since 1919 was the coordinator of the team that worked to combat syphilis in the Tuzla region and an active participant testified on the implementation of measures for eradication of endemic syphilis. Organized eradication started in 1927 (2). Unfortunately, epidemiological conditions, low material and hygienic development among the rural population of eastern and central Bosnia, during the implementation of activities for eradication

of endemic syphilis remained unchanged which resulted in recurrent syphilis infection which was the reason for slow and less efficient success of its eradication (3).

Even in 1929/30, Ante Vuletić from the School of Public Health in Zagreb visited in Breslau, known professor Jessner, who organized a scientific expedition in Mongolia to combat endemic syphilis and became familiar with the organization of such campaign, which they called “survey”. Franjo Kogoj (1931) writes in *Doctors Journal* on the need for “the survey on endemic syphilis”, with the implied insight into the extent and forms of the endemic syphilis incidence. After repeated appeals to the then Ministry of Health to “organize the survey of endemic syphilis modeled by Buryatia-Mongolian expedition”, in 1933 Kogoj place endemic syphilis as the main theme of the then Dermatological Society in Zagreb. Shortly after in 1933, thanks to the great understanding of the director of the School of Public Health Berislav Borčić and efforts of Andrija Stampar at the Rockefeller Foundation, created the final conditions to achieve such a survey. Rockefeller Foundation donated for this purpose 50,000 dinars for the first survey in 1934, and



Figure 1. Doctor Ante Vuletic (1899-1977) distinguished Croatian physician, specialist in social medicine and dermatology, who led the systematic population monitoring and research called "Survey" in 1934 aimed at combating endemic syphilis in central Bosnia (villages of Vlasic). He is the founder of the Health Home Care Centre in Travnik. He has received recognition of Israel as Righteous among the Nations. Figure on the right presents the scenes during the implementation "Survey".

10,000 dinars for the second survey in 1935. This created the preconditions, and the School of Public Health was able to approach to search for solution of this acute venerology social problems. School entrusted the organization of the survey to Ante Vuletic and called for cooperation School of Medicine in Zagreb. It should be noted that the Faculty of Medicine in Zagreb accepted the invitation of the School and chosen among its members the leading experts.

The epidemiological picture of endemic syphilis represented a health and scientific unresolved problem: there was one population process, it was claimed, where in the difficult social and unsanitary conditions of the then eastern and central Bosnia, similar to elsewhere in the world among the backward population groups where syphilis is present in large scale, and where syphilis was not treated at all, pathogenic strain of *Treponema Pallidum* develops endemic syphilis.

There was a so-called. Wilman theory that modern treatment favors the formation of visceral syphilis, especially of the cardiovascular system, and increasing incidence of syphilis affecting parenchyma of the nervous system, paralysis and tabes. A. Vuletic states (endemic syphilis in Bosnia, 1936) "... in order that our endemic syphilis, which is supposedly benign, due to a systematic campaign started about its suppression in 1927 could lose its mainly *dermotropic* and *gentle* character and become syphilis with all bad visceral and nerve diseases that were until then unknown in endemic syphilis".

Another formulation of the scientific problem was according to Gluck theory, that endemic syphilis in Bosnia significantly different from sporadic due to the fact that in general, or rare, occurring diseases of parenchymal organs. However, former experience based on observations of 14,000 people infected with syphilis (Vuletic 1936) argued the opposite, "that there

is no essential difference between endemic and sporadic cases, there is no difference in the affected organs, that with endemic syphilis occurring primary affects, diseases of the blood vessels and other internal organs, and can also appear diseases of the parenchymal organs".

And then, during two years, has started unique public health action in our history of public health. Group of doctors in preventive and curative medicine (then the term for those who only heal), social medics of former Croatia and Bosnia make comprehensive approach for solving endemic syphilis in central Bosnia. This group of well-known doctors and field workers, F. Kogoj and A. Vuletic specialists in dermatovenerology, Lopasic as neurologists, B. Gusic as an audiologist, B. Dragisic as pediatrician, V. Bojic as internists, A. Spanic as ophthalmologists, V. Frankovic as serology specialist, J. Rasuhin as a publicist, all of them from Zagreb, while in Travnik they were joined by doctor Dojmi and doctor Orlic venerologists from BiH (1,4,5). The first clinical trial and testing in order to start eradication of endemic syphilis was organized in June 1934 in the villages on mountain Vlasic in the city of Travnik (Central Bosnia and Herzegovina). They were intended to: detect essence of endemic syphilis; know the clinical picture and answer the question of whether its only manifestation is dermatotropic form or also occur specific tertiary lesions on the cardiovascular or central nervous system; unambiguously determine the differences between endemic and sex transferable syphilis; know the size of the problem on epidemiological scale.

From today's point of view of the organization and implementation of the survey and population surveys, the campaign on endemic syphilis integrally included resolving pathology endemic syphilis in central Bosnia. This Zagreb- Bosnian group of doctors followed the well-known textbook on the motto "people should be treated where they live", worked in makeshift clinics, usually temporarily organized in primary schools Vitovlje, Opara, Rankovic, Mehoric, Turbet, Bila, Gornji Vakuf and many other villages and settlements. They rode on horseback eight hours and dragged the mobile technological equipment on horses.

2. HISTORY OF ENDEMIC SYPHILIS

Carving from 1497 where are presented two patients whose skin is covered with characteristic lesions is the historical testimony that syphilis is an old disease. Carving was created just three years after the disease has spread across Europe for the first time. The display reveals a physician who holds a container with urine as the sample for diagnostic analysis. With second patient is a second doctor who applied mercury on lesions of patient's feet. Then the mercury was used as medicine- balm for syphilis, whose side effects were often worse than the disease itself (10).

The first description of syphilis was published by Fracastore Girolamo in his poem "*Syphilis sive morbus gallicus*", which stands for syphilis, the French disease in Verona in 1530 (the Gauls are the oldest inhabitants of the France). Actually Fracastore was the first who, then this terrible, venereal disease called syphilis by the shepherd *Sifil* who is offended *Apollo*, and was therefore punished with the disease. It is no wonder that for the Bosnian population endemic syphilis was known as "*frenjak*" (from the word *franch* = French) (13).

Endemic syphilis appeared in the 17th century in Scotland during the English Civil War. In the 18th century was recorded in

Nürnberg in Germany, Bern in Switzerland, then in Denmark, Norway, Ireland, Sweden and Scotland (5).

3. WHAT IS ACTUALLY ENDEMIC SYPHILIS?

Endemic syphilis, known by the people also by the names *frenjak*, *bejel*, *nonvenereal syphilis*, *skerljevo* or *bedzel* (2-3), is the non venereal disease of the skin and tissue caused by infections with spirochete subspecies; *Treponema pallidum subsp endemicum*. Previously it was thought that it cannot be distinguished from *Treponema pallidum* that causes sex transferable syphilis. From that originate the notion that disease is a modified form of syphilis, usually acquired in childhood by direct contact with active patients (contact with infected lesions on the skin and mucous membranes) or indirect transmission through objects for everyday use.

In endemic areas up to 90% of the population of a community can be infected. The initial lesion analogue to Çankırı particularly often occurs around the lips and oral cavity (due to the transfer of *Treponema* by pots/cups for drinking). After that occurs secondary generalized mucocutaneous dissemination, and changes on the skin, mucous membranes and bones are almost identical to those described in sex transferable syphilis or yaws. Skin lesions have often patchy irregular pigmentation. Ulcerated gum sores and periostitis that occurs only increase the similarity with syphilis. Visceral lesions still have not been described.

4. ENDEMIC SYPHILIS IN BOSNIA

In Bosnia the syphilis is known since 1834 (12). The spread of disease favored immigration and migration of soldiers and prisoners during the war and particularly poor hygienic conditions, poverty and illiteracy, as well as poor availability and organization of health care, particularly in rural areas (3). About endemic syphilis in Bosnia was first written by Leopold Gluck, a doctor working in Foca in 1889 (14). On the basis of chronological and historical confirmation of the assumption that syphilis and endemic syphilis in Bosnia comes from the Gaelic spread of disease through Europe (1,7).

In the period between the two world wars, when infectious diseases were a regular occurrence in Bosnia, with so-called social diseases, e.g. Tuberculosis, a special place is occupied by endemic syphilis (3). Infection of all members of the family/household was very common, but endemic syphilis occurred most often in children aged 2-15 years. The children were active carriers of disease and infection was equally represented in boys and girls. In adults, however, endemic syphilis was more common in women, probably because they were the first to interact with children (4-6).

The first definition of endemic syphilis in Bosnia and Herzegovina (BiH) has given professor Grin: "Endemic syphilis is limited to larger or smaller territory and time, appears and spreads mainly extragenitally and rapidly in all parts of the population, irrespective of age, gender and social status. Origin is still unclear" (8-9). Many people were affected by *frenjak*, especially in the districts of Cazin, Tuzla, Travnik and Bihac. Somewhat lower prevalence was in Mostar and Banja Luka (1,4-5). According to the descriptive data obtained in the survey by School of Public Health in Zagreb the prevalence of endemic syphilis (*frenjak*) in relation to the total population of Bosnia and Herzegovina was 8% (1). The prevalence of endemic syphilis



Figure 2. Doctor Ernest Grin (1899-1976), a Bosnian physician specialist in dermatology and university professor started the fight to combat syphilis, together with the team of Doctor Ante Vuletic in the "Survey". Organized action and fight against endemic syphilis and syphilis continued until its complete eradication in Bosnia 1955.

in relation to a specific population of rural endemic area was not estimated.

Especially important source for spread of infection was the use of contaminated drinking cups. Grin point out *pitcher* from which drank together not only family members but also neighbors in the field at the time when sowing and harvesting in the fields. Stew during lunch time was shared and taken to mouth only by one wooden spoon in the whole family, and the meal was located in a common pot. At that time was set a unitary hypothesis that syphilis, and endemic syphilis was caused by identical type of *Treponema pallidum*. Environmental factors play an important role in its appearance and expression.

With the development of the need to combat endemic syphilis in Bosnia and maintenance of the problem, they have developed experience and knowledge about this public health problem, and it has for long resisted all efforts. Abdulah Bukvica, the first doctor in Brcko at the time of the Kingdom of Yugoslavia and the first director of the general hospital in 1938 in Brcko, when in Tuzla's district, in the villages at the Majejica mountain, occurred a contagious disease *frenjak*, worked around the clock on its prevention and eradication (15).

The Second World War, war migrations, economic and social difficulties of the farmers were favorable for the renaissance of endemic syphilis. It is understandable that during the Second World War, due to fluctuations in population and extremely low standards of hygiene conditions, appeared many new areas affected by endemic syphilis. Re-organized was health campaign to combat endemic syphilis, and in 1946 was established the reference health institution-Institute for dermatovenerology disease in Sarajevo, which coordinated this activity. For the implementation of programs and research was in charge the regional team consisted of professor

Green, dr. Nadazdin, dr. Vorst, and associated international researchers dr. Guth, dr. Ridet, d. Grab and gentleman's Costa and Maxwell. Notable was the cooperation of international reference centers: the National Serology Institute in Copenhagen, Alfred Fournier Institute in Paris, the Centre for Disease Control in Atlanta and other (6-9). The World Health Organization (WHO) has launched a campaign since its establishment in 46 countries, which were coordinated in reference health centers and the United Nations (UN) until 1955. Significant efforts have been invested in establishing effective monitoring of infectious diseases (6, 8).

Although *Treponema pallidum* was identified as the cause of syphilis in 1905, and the prevalence rate of the disease has decreased after the discovery of antibiotics, even today it is still diagnosed worldwide around 12 million people with syphilis annually, while syphilis remains an important public health problem in low-income countries (10). Today it is widespread in the countries of the Sahel in Africa: Sudan, Southern Rhodesia, and South Africa; in parts of the Middle East among the Bedouin tribes of Saudi Arabia, Iraq and Syria; in parts of Asia: Southeast Asia, Turkey; and parts of the Western Pacific Manila and Philippines. In these areas, seropositivity prevalence in children reaches 40% and the early lesions are manifested in 2-20% of children. Rare cases of endemic syphilis were reported in the United States (US). Reported cases are usually diagnosed in immigrants and people who came to the US from endemic areas (10, 18, 21).

5. CONCLUSION

It is assumed that *Treponema pallidum* express clinical picture of infection that act in a variety of ways, depending on weather conditions and other environmental factors, life circumstances and individual factors such as age at which a person is infected. If this assumption is correct, then the renaissance of syphilis epidemic (repeated foci of endemic syphilis today) simply reflects the response of pathogens to changes in social behavior and habits. Sustainability in success of eradication depends on improved hygienic conditions and risk-free sexual behavior (20-24).

From today's point of view of the organization and implementation of the survey and population surveys, the example of campaign on endemic syphilis in central Bosnia integrally included its resolution. Today's techno-sciencology surveys lost this characteristic of integrity.

CONFLICT OF INTEREST: NON DECLARED

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