Research Article

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Parental knowledge, attitudes and perception of pneumococcal disease and pneumococcal conjugate vaccines in Mostar.

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ABSTRACT

Aim : The aim was to examine the knowledge, attitudes, and perceptions of pneumococcal disease and pneumococcal conjugate vaccines among parents of children aged 1 to 5 years.

Material and methods: This cross-sectional study was conducted in a kindergarten in Mostar with the assistance of an anonymous survey composed in Google Forms, which was sent to parents via email. The target group consisted of parents of children aged 1 to 5 years. The survey was sent on June 1, 2020, and it was completed on June 10, 2020.

Results: A slightly larger number of parents, 57% of them, declared that the information they receive from doctors about vaccines against children's infectious diseases, including pneumococcal diseases, is not clear and understandable. Only 15% of respondents received information about the possibility of vaccinating their child with the pneumococcal vaccine from a doctor, while most parents were informed via the Internet. Price, safety, side effects, and above all the fact that no one has recommended this vaccine to them are the main obstacles for parents to accept the pneumococcal vaccine. Most of the respondents, more precisely 59% of them, do not want to buy and vaccinate children with the pneumococcal vaccine.

Conclusion: That parents are theoretically in favor of vaccination but have little knowledge about pneumococcal conjugate vaccine and pneumococcal diseases. The fact that none of their doctors have recommended this vaccine to them diminishes its value. The fundamental elements for improving the current situation and combating the widespread and unfounded fear of vaccines involve the active participation of health workers in familiarizing parents with pneumococcal diseases and the possible consequences of the disease. Additionally, the introduction of a voluntary vaccination scheme could be beneficial.

Keywords : child, pneumococcal vaccines, parents, pneumococcal infections, fear.

INTRODUCTION

Pneumococcus, also known as Streptococcus pneumoniae, is a prevalent gram-positive human pathogen that have high mortality and morbidity, especially in young children, aged and immunocompromised people (1). Most pneumococci are encapsulated, and their surfaces are composed of complex polysaccharides. Capsular polysaccharides are one determinant of the pathogenicity of the organism. Pneumococci exhibit a high level of diversity in capsular polysaccharide structure, with over 100 capsular types (referred to as "serotypes") identified to date (2). The disease usually occurs suddenly, with fever accompanied by chills, and with general symptoms, signs indicating involvement of a specific organ soon appear [3]. Pneumococcal infections are divided into two groups: mucosal infections, including otitis, pneumonia, and sinusitis, and invasive pneumococcal disease (IPD) such as bacteremia, bacteremic pneumonia, meningitis,

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pleural empyema, osteomyelitis, orbital cellulitis, arthritis, endocarditis, soft tissue infections, and hemolytic-uremic syndrome . Some possible consequences of pneumococcal infection include hearing impairment, speech and language acquisition difficulties, behavioral and socialization problems and learning difficulties, reducing the quality of life for both children and parents. In an era of ever-increasing bacterial resistance to antibiotics, their effectiveness is increasingly limited. It is, therefore, crucial to take preventive measures against IPD, and immunization still remains the most effective method of preventing the disease [4,5].Currently, the vaccine against pneumococcal infection is registered, but it is not included in the mandatory child immunization program in the Federation of Bosnia and Herzegovina, and immunization against pneumococcal disease is carried out according to epidemiological and medical indications. Parents are the ones who decide whether their child will be vaccinated, and often the reason they do not want to vaccinate is a lack of knowledge and perception of the benefits of vaccines, associated with misinformation in the media and a strong anti-vaccination movement. The decision has a direct impact not only on the health of children but also on the broader society due to the low vaccination coverage of the pediatric population. The use of vaccines would not only improve the quality of life but also result in significant savings in healthcare costs. Considering the above, it is important to identify the factors that influence decision-making. The aim of the research is to assess, based on a questionnaire, the knowledge of pneumococcal diseases and evaluate the value of pneumococcal vaccine to parents, who are actually the main decision-makers and payers for non-mandatory vaccines.

MATERIALS AND METHODS

This cross-sectional study was conducted in a kindergarten with the help of an anonymous survey composed in Google Forms, which was sent via email to parents. The survey questionnaire was created based on similar studies and consists of four parts from which we gather data about parents, knowledge, attitudes, and vaccination practices. The target group was parents of children aged 1 to 5 years. A total of 80 parents participated who had previously consented to the survey and could withdraw at any time. The survey was sent on June 1, 2020, and the research was completed on June 10, 2020.
Frequency and percentage were used to display nominal variables. The chi-square test was used for the analysis of nominal variables. A significance level of $\alpha<0.05$ was accepted.

RESULTS

The study involved a total of 80 participants, out of which 71 were women (89%) and 9 (11%) were men. All parents were parents of different children. The participants belonged to the age group of 27 to 54 years. The majority of participants, 50 of them (62.5%), had a college education.

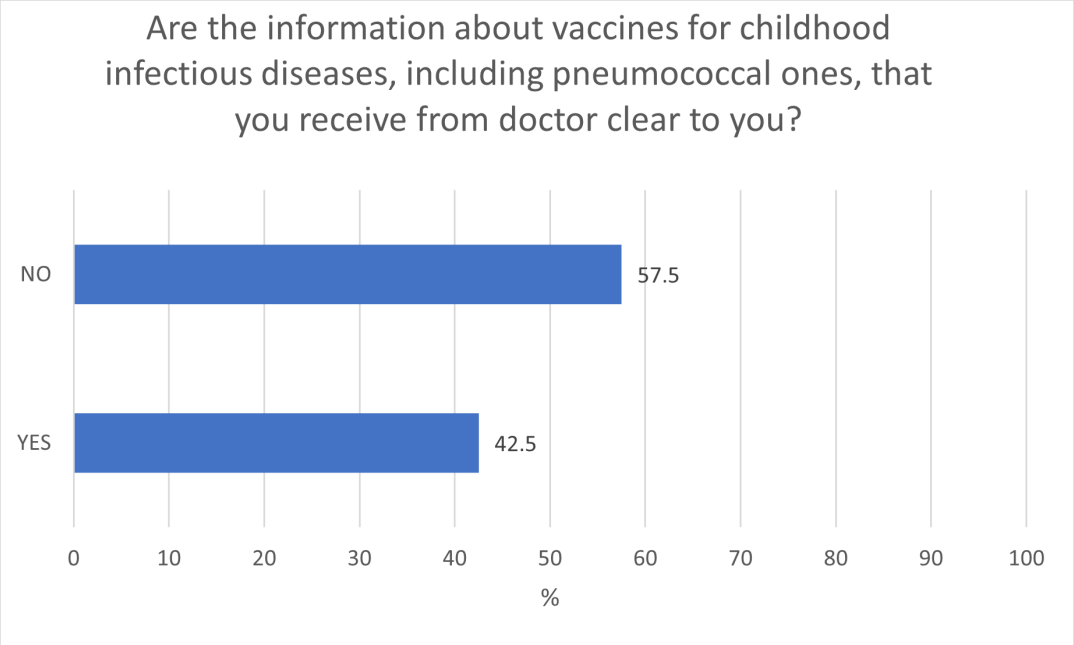
Table 1. Demographic and socioeconomic data on respondents.

		N	%
Gender	male	9	11,25
	female	71	88,75
Level of education	high school	10	12,50
	higher education	5	6,25
	college	50	62,50
	postgraduate studies	15	18,75
Employment status	employed	66	82,50
	part-time	1	1,25
	freelance	2	2,50
	unemployed	10	12,50
	student	1	1,25
How do you assess your social status	good	53	66,25
	bad	1	1,25
	average	26	32,50

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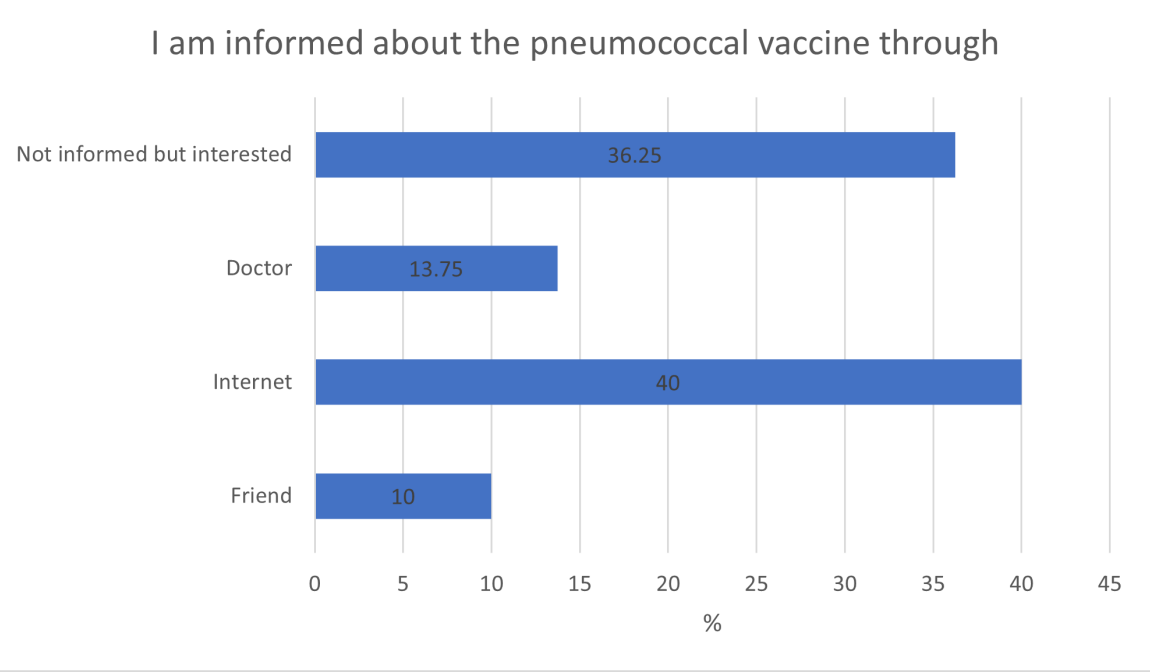
A slightly larger number of parents, 57.5%, indicated that the information they receive from doctors about vaccines against childhood infectious diseases, including pneumococcal diseases, is not clear and understandable.

Figure 1. Information about vaccines.



Regarding the possibility of pneumococcal vaccination, 36.2% of parents claim they did not receive information from their doctor, while 40% of parents were informed through the Internet.

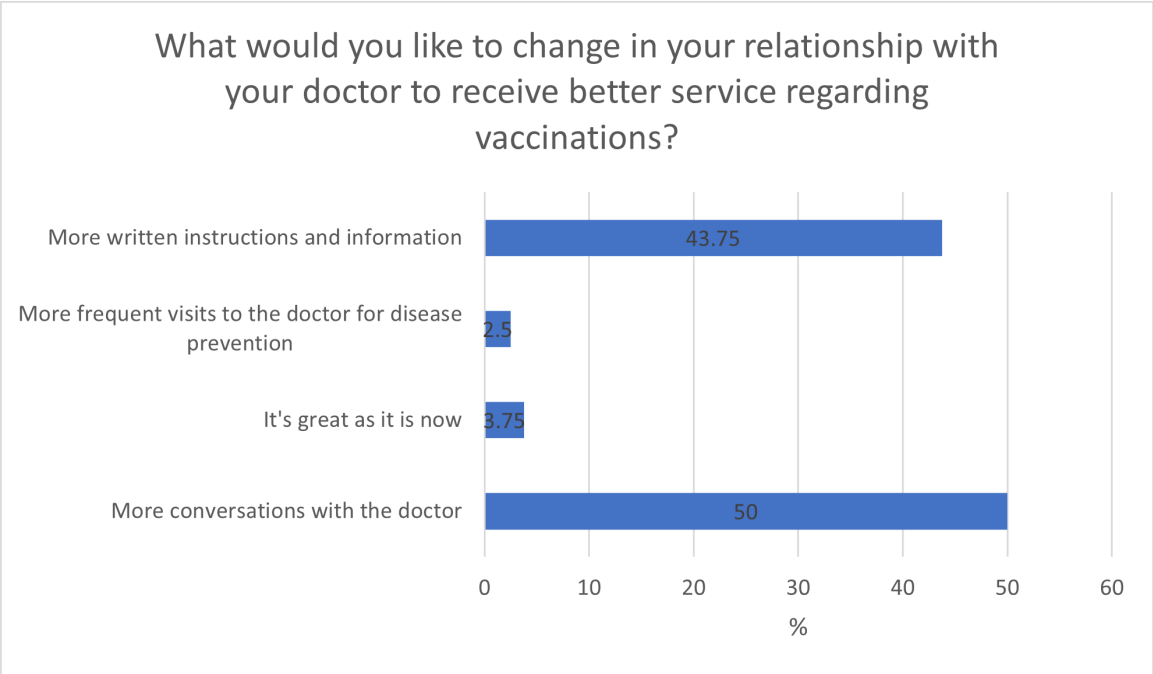
Figure 2. Parental awareness of pneumococcal vaccine.



Half of the respondents expressed a desire for more communication with their child's doctor and more written instructions and information, which is particularly important since the main reason they do not want to vaccinate their child is because it has not been recommended by the medical profession.

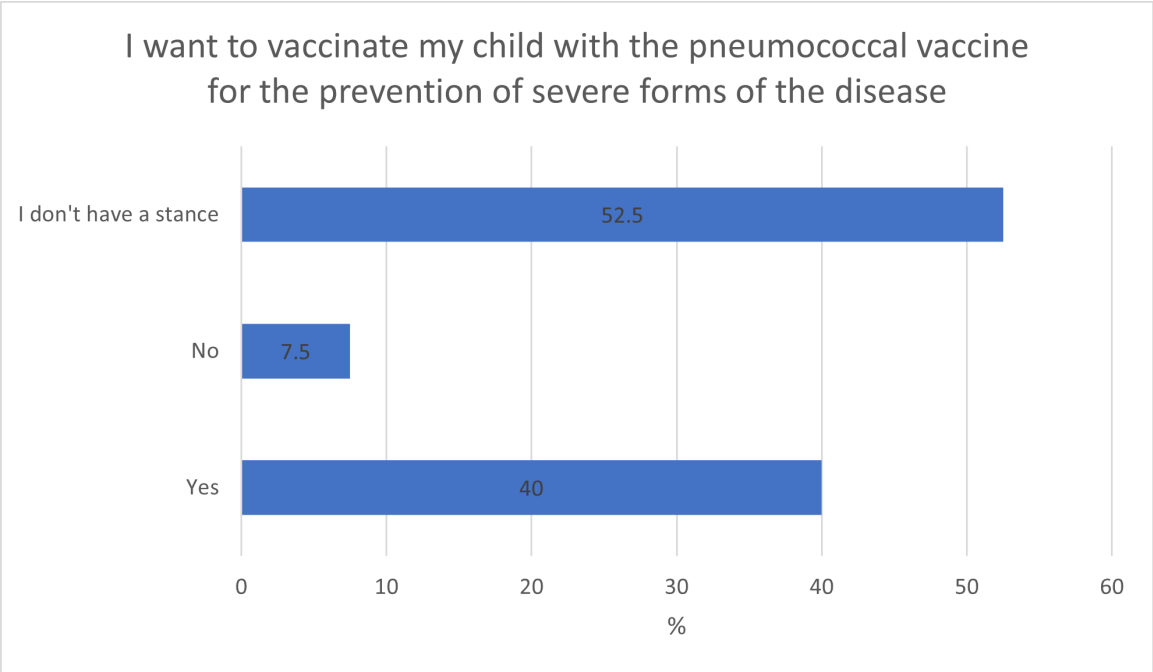
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Figure 3. Percentage of parents who want changes in their relationship with the doctor.



Parents' attitudes towards the justification of mandatory vaccination of their own children vary significantly, with the majority of respondents believing it should be voluntary. Opinions of parents differ when it comes to the best protection of children against pneumococcal diseases, with the largest proportion indicating that they do not know what that would entail. For the prevention of severe forms of the disease, 40% of parents want to vaccinate their child.

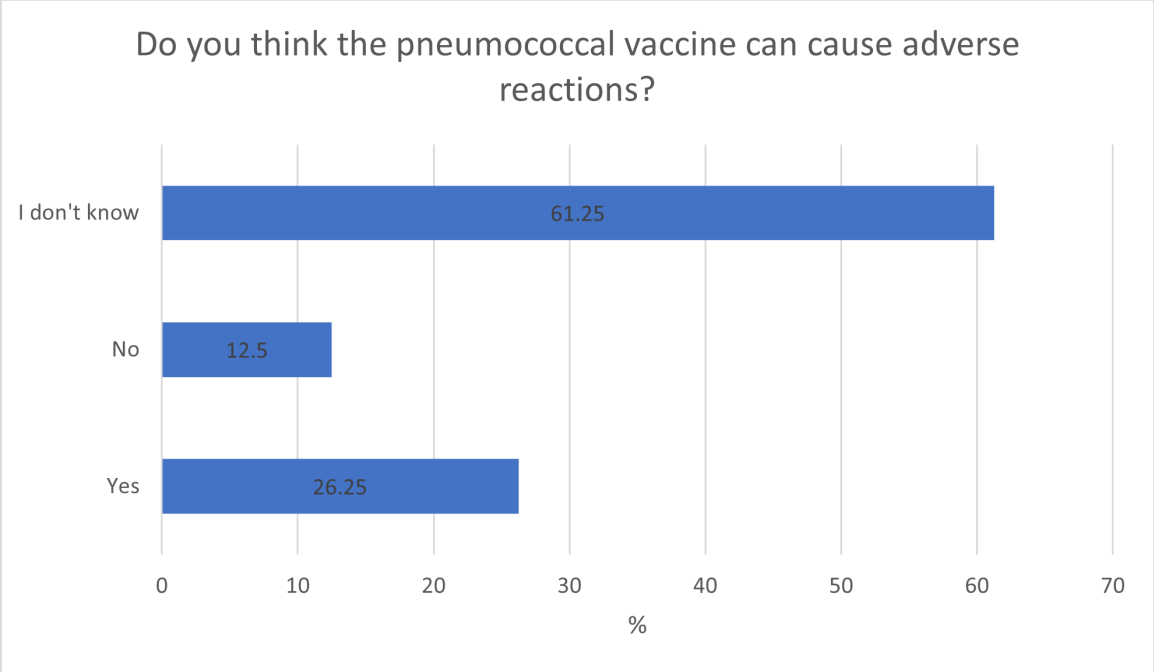
Figure 4. Percentage of parents who want to vaccinate their child with pneumococcal vaccine.



When it comes to adverse reactions caused by this vaccine, 26% of respondents believe that this vaccine can cause them, while 61% of parents do not know the answer to this question.

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Figure 5. Percentage of parents who think that the pneumococcal vaccine can cause adverse reactions.



Out of the total number of respondents 87% are not familiar with the price and availability of this vaccine in our market. The internet is the main source of information about the need for vaccination against pneumococcal diseases for 58% of parents. Half of the total number of parents believe they are poorly informed about the consequences of pneumococcal diseases or are not informed at all. A larger portion of respondents, more precisely 59%, do not want to purchase and vaccinate their children with the pneumococcal vaccine.

Table 2. Vaccination practice.

	N	%	χ2	p
The pneumococcal vaccine is too expensive and not available in our country			105,925	<0,001
yes	7	8,75		
no	3	3,75		
I do not know	70	87,50		
From whom did you get the most information about the need for vaccination against invasive pneumococcal diseases?			161,400	<0,001
medical staff	8	10,00		
parents of other children	5	6,25		
teachers / educators	1	1,25		
friends	5	6,25		
TV	1	1,25		
written media	5	6,25		
Internet	47	58,75		
other	8	10,00		
Do you think you are sufficiently aware of the consequences of invasive pneumococcal diseases?			33,300	<0,001
very well acquainted	4	5,00		
well acquainted	17	21,25		
poorly acquainted	40	50,00		
I am not familiar at all	19	23,75		

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If you do not want to vaccinate your child with this vaccine, give a reason			10,267	<0,001
too expensive	8	13,33		
possible side effects	23	38,33		
not sufficiently examined	19	31,67		
I am not interested	10	16,67		
I want to buy a vaccine and vaccinate my child with this vaccine			18,050	<0,001
yes	21	26,25		
no	59	73,75		

DISCUSSION

The majority of participants estimate that the information they receive from doctors about vaccines against childhood infectious and pneumococcal diseases is not clear and understandable enough. It is concerning that very few participants received information about the possibility of vaccinating their child with the pneumococcal vaccine from their doctor, and the majority of parents were informed via the internet, friends, or were not informed at all. Parents want more communication with their child's doctor and written instructions and information, as noted by other authors in similarly conducted studies. Although it has been shown that parents are poorly acquainted with the pneumococcal vaccine, just under half are now willing to accept and vaccinate their children for the prevention of severe invasive forms of the disease. Price, safety, side effects, and the fact that no one has recommended this vaccine so far are the main barriers for parents to accept the PCV. Although they agree with the statement "Vaccinating a child is one of the fundamental rights of a child", a larger proportion still believes that PCV should be voluntary. Parents do not know the best protection against pneumococcal diseases and the consequences of invasive pneumococcal diseases. These results suggest that efforts and activities to improve parental knowledge about IPD may positively influence the perceived value of PCV, which may affect parents' vaccination decisions. Medical staff could potentially influence the implementation of PCV by informing parents about the consequences of IPD and the benefits of vaccination and indirectly by providing informational materials via the Internet [10]. Similar results to this study are reported by researchers in Indonesia, where mothers report that doctors are reluctant to provide explanations about vaccines against childhood infectious diseases and treatment [11]. Researchers in Singapore report that most parents did not receive a recommendation for PCV vaccination, which is consistent with the results of this study [10]. In Japan, 25% of parents reported receiving vaccination information from sources such as television, the Internet, while in our study, this percentage is even higher, at 58% [12]. However, information from television and the internet can be incomplete, inaccurate, or biased, increasing fear and anxiety among parents about vaccinating their children. The fact that PCV is still unknown to parents in this study, yet they are willing to vaccinate their children for the prevention of severe forms of the disease, confirms that it is not only the level of knowledge but also their expectations of the healthcare system and access to care that guide their actions. Thus, in a study from Indonesia, mothers vaccinated their children not because they understood the seriousness of the diseases or the meaning of vaccines, but because they believed that the healthcare system provided them with safe services that would improve their children's health [11]. The aforementioned barriers to vaccination are often mentioned as parental concerns in other studies and could easily be overcome with the help of informational campaigns providing parents with accurate and precise information [13-15]. In contrast to this study, parents in Indonesia agreed that PCV should be mandatory as it is the only way to increase children's vaccination coverage [11]. Furthermore, more than half of the parents in this study do not know whether this vaccine causes adverse reactions. This is one of the main barriers to vaccination in today's world.

CONCLUSION

Parents refuse vaccines due to unjustified fears of side effects; however, many studies have shown that vaccines are safe and effective. Therefore, parental health education is the cornerstone on which public health should build its fight against vaccination hesitancy and improve vaccination coverage. The limitations of this study were the small number of participants and the fact that the pneumococcal conjugate vaccine has not yet been included in the Mandatory Immunization Program for Children in the Federation of Bosnia and Herzegovina, which is why a large number of participants are not familiar with PCV. Parents decide whether their child will receive vaccines or not. Knowledge and factors influencing vaccination decisions are complex. The decision not to vaccinate has direct consequences for both the health and well-being of children and for the broader community if herd immunity is not achieved due to low coverage of the pediatric population. Parents are theoretically inclined to vaccinate, but they have little knowledge about such practice,

sometimes unaware of the type of vaccine given to their children. Lack of knowledge about pneumococcal disease and its outcome and the inaccessibility of this vaccine diminish its value to parents regardless of the observed benefits. Increasing the perceived benefits of vaccination likely has a greater impact on vaccination decisions than attempting to change the barriers identified in the study. Fundamental elements for improving the current situation and combating widespread and unfounded vaccine fears include active participation of healthcare workers in informing parents about pneumococcal diseases and possible disease consequences, pneumococcal vaccines, and the introduction of a voluntary vaccination scheme.

Ethics Approvaland Consent to Participate

This cross-sectional study was conducted according to all ethical principles University Clinical Hospital Mostar. This study was approved by the Ethics Committee of Clinical Hospital Centre Mostar and valid documentation exists for this matter (number 660/20), date 02.09.2020.

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