



## RESEARCH ARTICLE

### EVALUATION THE EFFECT OF THE ABO GROUPING ON THE ERUPTION OF WISDOM TOOTH

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#### ABSTRACT

Eruption is defined as the movement of the tooth from its site of development in alveolar bone to the occlusal plane in the oral cavity. The tooth eruption is a complex and tightly regulated process which is divided into five stages

The ABO blood group was discovered in 1900 by Austrian scientist, Karl Landsteiner.

At present. The ABO blood group system consists of four antigens (A, B, O and AB). These antigens are known as oligosaccharide antigens, and widely expressed on the membranes of red cell and tissue cells as well as, in the saliva and body fluid.

Seventy student of twenty years old, they were diagnosed for the lower wisdom tooth eruption and compared to their ABO group, so they divided in to 4 groups (O,A,B and AB groups) which subdivided in to 2 subgroups, erupted lower wisdom tooth(1) and unerupted lower wisdom tooth(2).

Statistic analysis showed the correlation of the number, mean, standard deviation, stander error, lower and upper bounds, minimum and maximum values of data collected for both erupted and unerupted lower wisdom tooth. According to the ANOVA test(table 2) showed high significant difference between all groups ( $P < 0.01$ ) in the mean of case's number.

**Conclusion:** there were no relationship between the blood grouping and the eruption of the lower wisdom tooth

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## INTRODUCTION

Mammalian teeth develop as ectodermal organs bearing many similarities to other such organs like hair, feathers and mammary glands (Pispa and Thesleff, 2003). The timing of tooth development is highly heritable but also population-specific. Distinct stages in tooth development differ remarkably up to years between different ethnicities (Thesleff and Nieminen, 2005). Compared to the formation (that includes the formation of organic matrix and its subsequent calcification), the eruption (the emergence of teeth through the gingiva) of teeth seems to be less resistant to external influences. It is known that tooth eruption can be affected by tooth loss, caries and malnutrition (Thesleff, 2006).

Eruption is defined as the movement of the tooth from its site of development in alveolar bone to the occlusal plane in the oral cavity (Hani, 2010). The tooth eruption is a complex and tightly regulated process which is divided into five stages: preruption movements, intraosseous stage, mucosal penetration, preocclusal and postocclusal stages. Preruption movements occur during crown formation and are so small that they could only be observed by vital staining experiments (Almonaitiene *etal*, 2010). Active eruption movements occur when root formation begins and therefore it was believed that eruptive force comes from periodontal ligament. Although tooth eruption mechanisms are still under debate, it was suggested that periodontal ligament provides eruption force after the tooth has pierced gingiva but not during intraosseous stage (Wise *etal*, 2002).

Mandibular third molars (MTMs), or wisdom teeth, are the most frequently congenitally impacted teeth (Fayad *etal*, 2004). Although MTM, normally erupt at ages ranging from 16 to 24 (mean: 20) when they are in appropriate occlusion, about 40% of cases are partially or completely impacted (Niedzielska *etal*, 2006).

The ABO blood group system was discovered by Austrian scientist, Karl Landsteiner, who found three different blood types (A, B and O) in 1900 from serological differences in blood called the Landsteiner Law (Landsteiner *etal*, 1900). In 1902, DesCasterllo and Sturli discovered the fourth type, AB. The ABO blood group consists of four antigens (A, B, O and AB) (Daniels *etal*, 2004). Furthermore, the structure and biochemical characteristics of the ABO antigens were elucidated by many investigators. The genes of ABO blood group has been determined at chromosome locus 9 (Bennett *etal*, 1995)

The ABO blood group is determined by the presence of A and B antigens on the surface of the red blood cells, and of anti -A or anti -B antibodies in the serum. Thus, the red blood cells of blood type A possess antigen A and the serum containing anti -B antibody. Similarly, blood type B has antigen B and anti -A antibody. Blood type AB contains both A and B antigens but no antibodies. Blood type O has no antigens but contains both anti -A and anti -B antibodies. Anti -A and anti -B antibodies are usually IgM type, and not present in newborns, but appear in the first year of life. It is possible that the antibodies are produced against food and environmental

antigens (bacterial, viral or plant antigens) (Hosoi, 2008),

pricking a finger or by venepuncture (collected in sequestrine-

**Table 1** Descriptive statistics of ABO groups in relation to the lower wisdom tooth eruption

group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
O1	14	1.0000	.00000	.00000	1.0000	1.0000	1.00	1.00
O2	13	1.0000	.00000	.00000	1.0000	1.0000	1.00	1.00
A1	12	2.0000	.00000	.00000	2.0000	2.0000	2.00	2.00
A2	6	2.0000	.00000	.00000	2.0000	2.0000	2.00	2.00
B1	12	3.0000	.00000	.00000	3.0000	3.0000	3.00	3.00
B2	8	3.0000	.00000	.00000	3.0000	3.0000	3.00	3.00
AB1	1	4.0000	.	.	.	.	4.00	4.00
AB2	4	4.0000	.00000	.00000	4.0000	4.0000	4.00	4.00
Total	70	2.0429	.98445	.11766	1.8081	2.2776	1.00	4.00

**Table 2** ANOVA test of ABO groups in relation to the lower wisdom tooth eruption.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6721.502	3	2240.501	9049.34	.000
Within Groups	16.341	66	.248		
Total	6737.843	69			

**MATERIAL & METHODS**

**Materials**

1. Dental mirror(Germman)
2. Dental probe (Germman)
3. Blood sample collected from students
4. Test tube with anticoagulant
5. Glass slides
6. Anti ABO antibodies (China)
7. Anti Rh antibodies (China)

EDTA-anticoagulantcoated tubes).

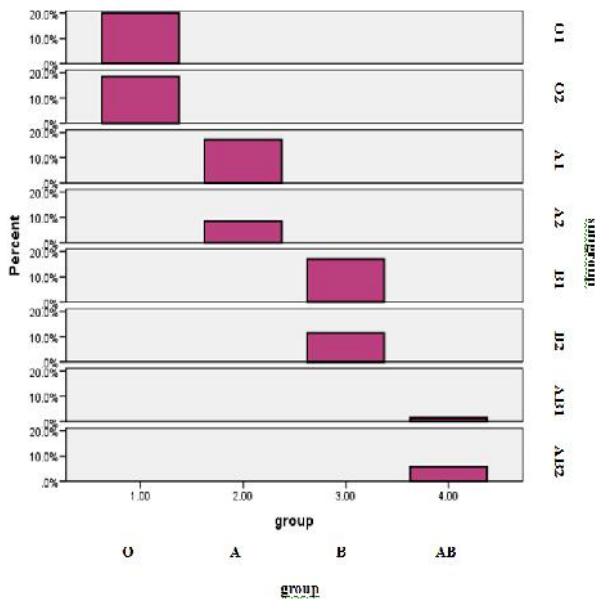
**RESULTS AND DISCUSSION**

Table (1) showed the correlation of the number, mean, standard deviation, stander error, lower and upper bounds, minimum and maximum values of data collected for both erupted and unerupted lower wisdom tooth. According to the ANOVA test(table 2) showed high significant difference between all groups (P<0.01) in the mean of case's number.

Comparison the percentage of the mean of cases number in relation to the eruption or uneruption of lower wisdom tooth, showed that the O group is the highest mean value followed by A and B groups of erupted lower wisdom tooth then the AB group of unerupted wisdom tooth (figure 1). The was no difference in the percentage of O subgroup, which showed both anti A and anti B antibodies, while other groups showed difference in the percentage of their subgroups which showed anti B for A group and anti A for B group and non A nor B antibodies for AB group. According these result there was no relation between blood group with the eruption of the lower wisdom tooth.

The Rh study of these groups showed that the lower wisdom tooth erupted in the Rh- student in comparing to the Rh+ group.

This research is regarded as a first studying in relationship of tooth eruption with the ABO grouping.



**Figure 1** Comparison the percentage of the mean of cases number in relation to the eruption or uneruption of lower wisdom tooth.

**Methods**

Seventy student of twenty years old of the second stage in dentistry collage would be taken in this study(students with systemic disease, orthodontic problems and oral disease would be excluded in this study), they were diagnosed for the lower wisdom tooth eruption and compared to their ABO group, so they divided in to 4 groups (O,A,B and AB groups) which subdivided in to 2 subgroups, erupted lower wisdom tooth(1) and unerupted lower wisdom tooth(2). Also the Rh +or – were calculated. Blood samples were obtained from students by

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