

EVALUATION OF SEVEN EXPERIMENTAL STAPHYLOCOCCAL PHAGES

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ABSTRACT

The percentage of strains of *Staphylococcus aureus* that can be typed with the basic set phages has fallen in recent years (1,2,3). It appears, therefore, that an increasing proportion of staphylococci, for whatever reason, are unsusceptible to the basic set phages and it is essential that new phages be introduced if the situation is to be improved.

Seven new phages have been issued by the International Reference Centre on Phage-Typing of Staphylococci, to several reference laboratories so that the value of these phages could be assessed. This is the report of our laboratory at the School of Public Health, Section of Staphylococcal Phage-Typing, on the effectiveness of these new phages.

MATERIALS AND METHODS

Coagulase-positive staphylococci were regarded as *Staph. aureus*. These strains were collected from various sources in Teheran as shown in Table I. The phage-typing was performed according to the standard methods of Blair and Williams (4). The strains were typed at RTD** and 100 RTD. When the strains were recognized as non-typable at the above-mentioned dilutions, they were then typed by the seven experimental phages at RTD and 100 RTD. The seven experimental phages were as follows: 84, 85, 89, 90, 92, 95 and 96.

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** RTD = Routine Type Dilution. (This is the highest dilution of phage which gives confluent lysis).

RESULTS

Table I
Sources of 302 strains of
Staphylococcus aureus studied

pus	152
throat	61
nose	15
food specimens	74
	302

Table II

Percent of non-typable strains among
302 strains of *Staphylococcus aureus*
typed by present international
basic set of phages

No. of strains studied	No. of non- typable strains	Percent of non- typable strains
302	172	59.9

Table III

Effectiveness of seven new phages on
172 strains of *Staphylococcus aureus*
non-typable by basic set phages

No. of Strains Analysed	% of Strains Non-typable by New Phages	Per cent of N.T. Strains Analysed by following phages							
		84	85	89	90	92	95	96	
172	48.8	8	12	8	11	20	15.6	14.2	

N.T. = Non-typable

As shown in Table III, 172 strains which were non-typable by the basic set phages were then phage-typed by the experimental phages. Addition of the above seven phages would help decrease the number of non-typable among 302 strains from 172 (56.7%) to 84 (27%).

DISCUSSION

An ideal situation would be when we would be able to phage-type all strains of *Staphylococcus aureus*. This is not, however, possible and, as mentioned previously, we have been getting further away from this goal. This is clear from the 1970-74 report of the International Subcommittee for Phage-Typing of Staphylococci (2). Our own result in this study, which shows that 57% of the strains were non-typable, further confirms the problem. Therefore, new phages should be introduced. The effectiveness of the phages may be different in various localities, but it seems essential that, in order to maintain the principle of standardization, the new addition of phages to the basic set should be of those which show their usefulness in the majority of areas. On this basis, and by comparison of results from different countries, the Sixth International Subcommittee for Phage-Typing of Staphylococci which met in Brno, Czechoslovakia, last summer, agreed to introduce the phages 92, 95 and 96 into the basic international set. At the same time the phages 187 and 42D, which had become less and less useful during the last few years, were set aside from the international set. Our results in Table III also show that the three phages 92, 95 and 96 were the most useful ones in our locality.

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REFERENCES

1. Hashemian, H. and Gharagozloo, R. (1966). A study of incidence of post-operative sepsis in Iran. *Acta Medica Iranica IX*:43.
2. Report of International Subcommittee for Phage-Typing of Staphylococci, 1970-74.
3. Jevons, M.P. and Parker, M.T. (1954). The evolution of new hospital strains of *Staphylococcus aureus*. *J. Clin. Path.* 17:243.
4. Blair, J.E. and Williams, R.E.O. (1961). Phage-typing of staphylococci. *Bull. Wld. Hlth. Org.* 24:771.