

## **Results of HyperQ Stress data analysis**

Tel Aviv, May 7<sup>th</sup>, 2017 – BSP (TLV:BSP) announced today that a retrospective analysis of more than 3000 patients from 8 clinical studies has shown that the HyperQ Stress technology detects ischemic heart disease more accurately compared to conventional exercise ECG. In all of the clinical studies, the reference test that was used as a gold standard was a reliable imaging test. In the large majority of the patients it was nuclear imaging SPECT and in about 10% it was invasive coronary angiography. In a few cases CT angiography was used. Independent interpretation of the imaging tests determined whether the patient had significant ischemia, which was considered as positive for ischemic heart disease. The HyperQ Stress was compared to conventional exercise ECG analysis which is based on ST segment changes.

The examination of more than 3000 exercise ECG tests demonstrated that the sensitivity<sup>1</sup> of HyperQ Stress (71%) was considerably higher than that of conventional ECG (42%) and the difference was statistically significant. The specificity<sup>2</sup> remained virtually unchanged when HyperQ Stress (79%) was compared to conventional ECG (80%) and the difference was not statistically significant.

It is important to note that the prevalence of significant disease in the entire cohort was only 10.3% which means that close to 90% of patients who were enrolled to the various studies did not actually need the imaging test to which they were referred. Since these imaging tests include radiation and are very expensive compared to exercise ECG, prescribing them to so many patients with low likelihood of ischemic heart disease results in extremely high expenses and increased health risks. The low yield of imaging tests, SPECT in particular, is a known problem and has been discussed in the cardiology literature in recent years.

However, with the low sensitivity of exercise ECG, which is estimated by the European Society of Cardiology to be 45%-50%, exercise ECG on its own cannot be effectively used as a gatekeeper. The significant improvement in sensitivity by HyperQ Stress which

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<sup>1</sup> The percentage of patients with disease who are correctly diagnosed as such

<sup>2</sup> The percentage of patients without disease who are correctly diagnosed as such

analyzes the same ECG data, without loss of specificity, makes it an ideal candidate for this task.

The current results are based on the HyperQ analysis alone. While the accuracy is greatly improved, it is also important to consider the conventional ECG results. Since both results stem from the same exercise test, clinicians can use the additional data provided by HyperQ in order to make a more informed and accurate diagnosis. The fact that the HyperQ signal arises from the QRS complex (the depolarization phase of the cardiac cycle) while conventional ECG analyzes the repolarization phase suggests that these two tests are complementary and together, they provide much more information and an in-depth analysis of the electrical activity of the myocardium.

	ExECG	HyperQ	ExEcho	SPECT	CTA
<i>Cost</i>	\$	\$	\$\$\$	\$\$\$	\$\$\$
<i>Safety</i>	+	+	+	-	-
<i>Availability</i>	+	+	-	-	-
<i>Accuracy</i>	-	+	+	+	+

The table above compares some of the diagnostic tests for stable ischemic heart disease. Exercise ECG (ExECG) is the most common one today, but suffers from very low sensitivity so most patients who have significant disease are not diagnosed. Exercise echocardiography (ExEcho) does not involve radiation but is highly dependent on the clinician who performs it and requires an expert which limits its availability. HyperQ, which analyzes the data of an exercise ECG test remains safe, widely available and low-cost while providing much better accuracy.

About BSP – Biological Signal Processing Ltd. is a ground-breaking technological company, revolutionizing non-invasive diagnosis of ischemic heart disease. The HyperQ™ line of products, which is based on the patented high frequency technology, offers solutions for both Stress ECG tests and Resting ECG tests. BSP has been publicly traded on the Tel Aviv Stock Exchange since 2006. Its headquarters are located in Tel Aviv, Israel.