Pain During Percutaneous Liver Biopsy in Chronic Liver Disease Patients a Pilot Study

Khalid S.R.,[1] Qureshi S.A.,[2] Tanvir A.,[3] Luk N.H.,[4] Mirza S.A.,[5] Saeed F.,[6] Rana W.A.[7]
Address for Correspondence: *Shahbaz Ahmed Qureshi, Assistant Professor, Department of Medicine, Bahawal Victoria Hospital, Qaid-e-Azam Medical College Bahawalpur Pakistan*

Purpose: To compare pain levels as measured by visual analog scale (VAS) between pain experienced during local anesthesia and pain during Percutaneous Liver Biopsy (PLB).

Study Design: This is an observational study.

Place and Duration of Study: This study was conducted for one year i;e July 2007-July 2008 at Combined Military Hospital, Sialkot.

Materials and Methods: Adult patients suffering from chronic liver disease were selected for liver biopsy. They were explained the biopsy procedure and also how to mark the visual analogue scale from 0 to 100. On that scale, the left end point, 0, was defined as no pain and the right end point, 100, as the worst pain the patient could imagine. There were no further marks on the line. Prothrombin time, platelet count, and a complete blood count were obtained prior to the biopsy. Biopsy was done under local anesthesia. Patient was asked to mark the visual analogue scale both for pain during local injection and for biopsy on two separate lines just after the procedure.

Results: Out of 51 patients, 27 (52.9%) were female and 24 (47.1%) male. Mean age was 36.3 ± 8.1 years. Thirty three (64.70%) has less than 23 mm pain on VAS scale during local anesthesia compared to pain felt during biopsy which was less than 19 males on VAS among 64.70% cases. In the rest of patient biopsy was pain free ($P = 0.05$). Pain has no correlation with age ($P < 0.12$) and needle size ($P < 0.15$).

Conclusion: In conclusion, the results of this pilot study suggest that, although deemed as minor, pain experienced during Percutaneous liver biopsy should be taken into consideration and that patients should be provided adequate prophylactic analgesia.

Key Words: Visual Analog Scale (VAS), Percutaneous Liver Biopsy (PLB).

Introduction

Pain is a symptom common to diverse type of conditions, including, disease, and procedures. It has been evaluated in many different conditions, in order to determine its severity objectively and to find medications and improve the methods to decrease its intensity. With a high prevalence of chronic liver disease in our country liver biopsy is done more often. Percutaneous liver biopsy for the diagnosis of liver disease is a well-established, widely and routinely used procedure with low morbidity.[1] Percutaneous liver biopsy is an important tool for evaluating liver diseases to establish prognosis and treatment. Patients with inflammatory viral diseases may need to undergo more than one biopsy during the course of their illness. The first Percutaneous liver biopsy was performed in 1883 in Germany.[2] However, the technique required up to a 15-minute intrahepatic phase, making it impractical and probably unsafe. The procedure became more widely used after Menghini reported a quick "one-second needle biopsy of the liver" technique in 1958.[3] Among the population affected, there is a recognized fear of biopsy because the procedure is as invasive and painful and one that may lead to serious complications.[1,3] There is great apprehension in patients when advised liver biopsy, majority of them refuse the procedure just because of the anticipated pain. In this study we evaluated severity of liver biopsy pain in chronic liver disease patients, objectively using visual analogue scale (VAS).

Materials and Methods

This study was conducted at Combined Military Hospital, Sialkot for the period of one year i;e July 2007-July 2008. Adult patients admitted in medical department suffering with chronic liver disease were selected for liver biopsy. Liver biopsy was performed at bedside according to the Menghini technique.[4] Prothrombin time, platelet count, and a complete blood count were obtained prior to the biopsy. They were explained the biopsy procedure and also how to mark the visual analogue scale from 0 to 100. On that scale, the left end point, 0, was defined as no pain and the right end point, 100, as the worst pain the patient could imagine. There were no further marks on the line. Patients were asked to mark the visual analogue scale both for pain during local injection and for biopsy on two separate lines just after the procedure. Biopsy was done under local anesthesia, using 8cc 2% lignocain without adrenaline, injected with a 19#; 10cc syringe in the upper border of the lower rib at a site already marked by ultra sound. Liver biopsy was done using an 18 or 16 # sure cut needle. Nick with a knife was not

given; rather skin was pierced with boring movement of the needle itself in the same tract in which local anesthesia was given. Placement of the needle in the liver was ensured by seeing the movement of the needle while the patient took deep breaths. After ensuring the placement of needle in the liver parenchyma by asking the patient to hold his breath in mid expiration, suction was applied and biopsy taken. However, we have observed using the VAS, the validated and recommended method to grade pain as in one of the study.[5]

Results

A total of fifty one patients were enrolled, out of these 27 (52.9%) were females and 24 (47.1%) males. Mean aged was 36.03 ± 8.1 years, females 37.7 ± 7.5 years (SD + 75), age ranged from 26 to 58 years. In males mean age was 34.16 ± 8.02 ranging from 19 to 52 years as shown in Table 1. Pain while injecting local anesthesia and during liver biopsy did not show any statistically significant gender difference (p = .61). There was no correlation with age, (p = 0.12) and needle size (p = 0.15). Thirty three (64.70%) of the patients marked less than 23 mm on the VAS scale for local injection pain. Minimum pain was 2mm on VAS scale. Thirty three (64.70%) of the patients marked less than 19 mm on VAS scale for pain during biopsy as shown in Table 2. Surprisingly out of these 18 (35.30%) did not feel any pain at all (zero pain on VAS scale). There is a statistically significant difference between pain felt during local injection and while introducing sure cut needle and doing liver biopsy (p = .005).

Table 1: *Demoghraphic data of patients experiencing pain during liver biopsy. Total patients (n = 51).*

Data	Percentage (%)
Male	24 = (47.1%)
Female	27 = (52.9%)
Mean age in years(range) males	34.16 ± 8.02 years
Mean age in years(range) females	37.7 ± 7.50 years

Table 2: *Pain on VAS Scale During Anesthesia and during biopsy.*

Pain Scale (VAS)	Local Anesthesia (51 cases)	Biopsy (51 cases)	Significance
< 23 mm	33 = 64.70%	-	-
< 19 mm	-	33 = 64.70%	< 0.005
No pain	-	18 = 35.30%	-

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All liver specimens could be obtained at first passage. Mean VAS pain scores were 15.09 mm (range, 15-2O) at D0 and 8.29 (range, 10-11) at D1, respectively/

	Mean	SEM
D_0	15.0980	2.0133
D_1	8.2941	1.8103

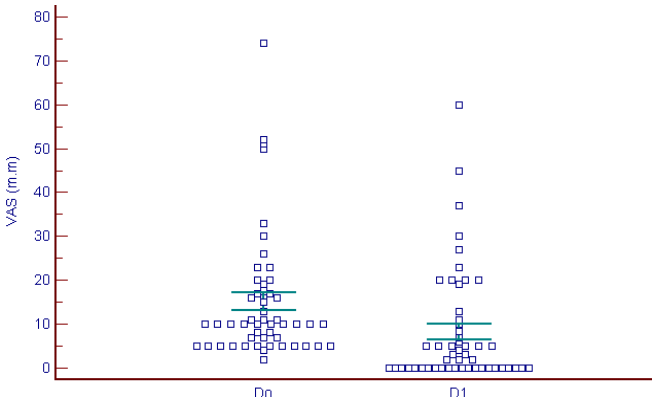

Fig. 1: *Box and whister plot shows the pain scores measured by the VAS at the end of the procedure (D_0) and the next day (D_1). Individual data, Mean ± 1 SEM values are indicated by the lines,*

Discussion

Percutaneous needle liver biopsy is an important procedure for the diagnosis and evaluation of liver disease and is frequently associated with pain..[6] However, it is invasive and often considered very painful by the patients. In this study as well as in several others.[10-12] Pain was mild to moderate. In this study we used a suction technique needle (sure cut). Site of prick already marked by the radiologist was cleaned; Lidocaine (8 cc of 2 percent solution) is injected over the upper border of the rib to avoid intercostals vessels that traverse along the lower border of each rib. We used 8cc 2% lidocaine solution as compared to one of the study where 10cc of 1% lidocaine was used for local anesthesia. Usually small scalpel incision is made and a trocar is used to dilate the tract but tract was not dilated in this study. A small amount of saline is flushed into the peritoneal cavity to eliminate any fat tissue that may have entered the needle during the passage into the peritoneal cavity.[7] Then while applying suction and with the patient holding his/her breath transiently in expiration phase, the biopsy is done minimizing the time during which the needle is within the liver. A similar approach without saline flushing applies to cutting needles, including either the manual True cut needle or the spring-loaded and automatic needles. In one of the study mean VAS pain scores were 28 + 3 mm (range, 5 – 91).[7] Six out of 30 patients (20%) experienced severe pain (i.e. VAS .40 mm). No studies are done documenting pain using this technique either with the technique we used the average biopsy size obtained was 1.5cm with average numbers of portal tracts. Although the needle used for injecting local anesthesia was #19 and for liver biopsy # 18 and 16; pain felt while giving local anesthesia was significantly more than

felt during liver biopsy (p<.005). However there was no difference in pain perception between #16 and # 18 sure cut needles.

Standard post procedure instructions were followed. There were no major complications, except for varying degree of post procedure upper abdominal, and right shoulder tip pain. In one patient repeat ultra sound abdomen was done to rule out intra abdominal bleed, which was not there. The minimal duration of observation that is safe has not been clearly established; an observation period as short as one hour has been described. We kept our patients under observation for 6-8 hours before they were allowed to get off the bed.

Standard Percutaneous liver biopsy observation includes monitoring the patient's vital signs every 15 minutes for the first hour, every 30 minutes for two hours, and then hourly for, four hours after biopsy. Furthermore, according to Sherlock and Dooley[8] "sedation is not given routinely before biopsy as it may interfere with the patient's cooperation." Schiff and Schiff[9] stated that "it is not necessary to premedicate the patient before the biopsy." Thus, not unexpectedly, a nationwide survey in France showed that sedation or premedication was given in only 46% of 2084 biopsies.[10] This study was aimed to investigate Detailed and clearly written post-procedure instructions should be discussed with the patient before discharge. Although not consistent, a greater risk of bleeding following a biopsy has been observed with larger-diameter needles. No statistically significant gender difference in pain perception was observed (p < .37).

Conclusion

The study concludes that the pain perceived during anesthesia is more than the actual procedure. Where as 35.30% of the patients did not feel any pain at all during the insertion and taking biopsy with the sure cut needle regardless of the needle gauge. So patients should be provided before liver biopsy with adequate prophylactic analgesia.

References

1. Piccinino F, Sagnelli E, Pasquale G, Giusti G. Complications following percutaneous liver biopsy—a multicentre retrospective study on 68276 biopsies. J Hepatol 1986; 2: 165-173.
2. Van Leeuwen, DJ, Wilson, L, Crowe, DR. Liver biopsy in the mid-1990s: Questions and answers. Semin Liver Dis 1995; 15: 340.
3. McGill DB, Rakela J, Zinsmeister AR, et al. A 21 year experience with major hemorrhage after percutaneous liver biopsy. Gastroenterology 1990; 99: 1396–09.
4. Menghini G. One second biopsy of the liver: problem of its clinical application. N Eng J Med 1970; 283: 582-585.
5. Price DD, McGrath P, Rafii A, Buckingham B. The validation of visual analogue scales as ratio scale measures for chronic and experimental pain. Pain 1983; 17: 45-56.
6. E. Eisenberg, MD, M. Konopniki, MD, E. Veitsman, MD, R. Kramskay, MD, D. Gaitini, MD, and Y. Baruch, MD . Prevalence and Characteristics of Pain Induced by Percutaneous Liver Biopsy. Anesth Analg 2003; 96: 1392-1396.
7. Laurent Caste´ra, M.D. Isabelle Ne `gre, M.D. Kamran Sami, M.D. Catherine Buffet, M.D. Pain Experienced During Percutaneous Liver Biopsy. Department of Hepatology and Gastroenterology, Department of Anesthesia and General Intensive CareHoˆ pital Biceˆtre Universite´ Paris-Sud, Le Kremlin-Biceˆtre, France (correspondence 1530 Hepatology Dec. 1999.
8. Sherlock S, Dooley J. Needle biopsy of the liver. In: Sherlock S, Dooley J, eds. Diseases of the liver and biliary system. 9th ed. Oxford: Blackwell Scientific, 1993: 33–43.
9. Schiff L, Schiff ER. Needle biopsy of the liver. In: Schiff L, Schiff ER, eds. Diseases of the liver. 7th ed. Philadelphia: JB Lippincott, 1993: 216–25.
10. Cadranel J, Rufat P, Degos F. Practices of liver biopsy in France: results of a prospective nationwide survey. Hepatology 2000; 32: 477–80.
11. Farrell RJ, Smiddy PF, Pilkingyon RM, et al. Guided versus blind liver biopsy for chronic hepatitis C: clinical benefits and cost. J Hepatol 1999; 30: 580–7.
12. Castera L, Negre I, Samii K, et al. Pain experienced during percutaneous liver biopsy. Hepatology 1999; 30: 1529–30.